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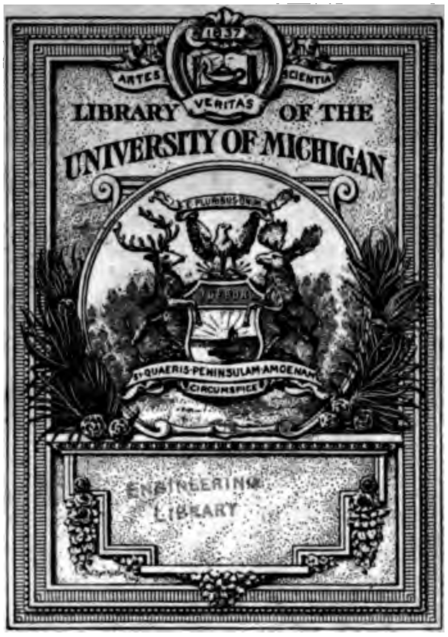

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TREASURY DEPARTMENT
UNITED STATES COAST AND GEODETIC SURVEY
O. H. TITTMANN
SUPERINTENDENT

# LIST AND CATALOGUE
OF THE
# PUBLICATIONS
ISSUED BY THE
# U. S. COAST AND GEODETIC SURVEY

## 1816–1902

By E. L. BURCHARD, Librarian

WASHINGTON
GOVERNMENT PRINTING OFFICE
1902

Rec'd, 6-19-44 DLR

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# PREFACE.

The following List (Part I) and Catalogue (Part II) was compiled in response to demands for information in regard to the publications of the United States Coast and Geodetic Survey, and relates entirely to these publications:

Previous to July 1, 1878, this Bureau was called the United States Coast Survey, which explains the apparent discrepancy in the title of the publications issued before and since that date.

The List is arranged in chronological order and the Catalogue alphabetically by authors, subjects, and places, with numerous cross references. All of the subject headings used in this Catalogue are given in systematic order at the beginning of the Catalogue.

The publications in the List and Catalogue marked "Exhausted" are no longer available for distribution. All others can be obtained, free of charge, upon application to the Superintendent United States Coast and Geodetic Survey, Washington, D. C., except the Coast Pilots and Tide Tables, which are sold at the cost of paper and printing.

Indexes and catalogues of the Survey's publications have previously been issued under the following titles:

### REPORTS ONLY.

| | | |
|---|---|---|
| **1844–1853.** | "Consolidated alphabetical index." Subjects and authors in one alphabetical arrangement. By Lieut. E. B. Hunt, U. S. A., assistant | In Report 1854 |
| | "Consolidated index of sketches." Also by Lieutenant Hunt | In Report 1854 |
| **1854–1863.** | "Consolidated alphabetical index." By Subassistant F. F. Nes | In Report 1864 |
| | "Consolidated index of sketches." Also by Mr. Nes | In Report 1864 |
| **1851–1870.** | "General index of professional and scientific papers," arranged systematically in classes by subjects. This is the Hunt index recompiled and arranged in a new order by Edward Goodfellow, assistant | App. 17, Report 1871 |
| **1845–1880.** | "General index of scientific papers." Subject classification. By C. H. Sinclair, subassistant | App. 6, Report 1881 |

### ALL PUBLICATIONS.

| | | |
|---|---|---|
| **1844–1885.** | "Descriptive catalogue of publications." This is the first list of publications, but included also some additional indexing and much bibliographic material. Prepared by Assistant Goodfellow | App. 6, Report 1883 |
| | "General index to the progress sketches, illustrations, maps, and charts." The index enlarged and arranged in classes by places and subjects by Edward Goodfellow, assistant | App. 12, Report 1887 |
| **1807–1890.** | "Descriptive catalogue." The index of Goodfellow and catalogue of Sinclair revised and enlarged. By Assistant J. B. Baylor | App. 11, Report 1891 |
| **1807–1898.** | "Bibliography." The preceding edition republished with additions. Special publication No. 2, 1898. | |

# PART I.—LIST.

# ANNUAL REPORTS.

The Annual Report of the Superintendent of the United States Coast and Geodetic Survey, fully illustrated with maps and diagrams, is made under law to Congress at each session, and shows in detail the persons employed, the work accomplished, and the expenditures under the annual appropriations.

Originally appearing as a document in the Congressional series only, it has also been published in a separate Survey edition since 1851. For 1851 separate volumes were issued for the text and for the sketches. From 1891 to 1894, inclusive, the report proper and the appendices were printed in separate volumes as Parts I and II. With these exceptions the report has been issued annually since 1851 in one quarto volume.

The appendices on scientific and professional subjects include almost all of the material of that character published by the Survey, whether issued in some other series or not. The appendices have also been printed apart from the reports in "separate" form when the demand for them has warranted such publication.

In the earlier reports of the Coast Survey statements of progress made in office operations will generally be found following the abstracts of reports of field work, attention also being called to office work of special interest or importance in the introductory portions of the reports. This will be found to apply to the annual reports from 1844 to 1855, inclusive.

In the reports from 1856 to 1864, inclusive, in addition to the notices of office operations in the body of each report, there are appendices which contain reports from the chiefs of the divisions of the office, or, in some cases, the complete reports of the assistant in charge of the office and of the chiefs of divisions.

The publication of the annual reports of the assistant in charge of the office and of the chiefs of the office divisions was discontinued during the years 1865 to 1880, inclusive, and the references to office operations were made in the same manner as those in the annual reports of the Survey from 1844 to 1855, inclusive, these references being supplemented by appendices giving lists of drawings or engravings of charts in progress or completed and by appendices detailing the field and office work relating to tides.

In the annual report for 1881 the reports made by the chiefs of the computing, tidal, drawing, engraving, and hydrographic divisions of the office were printed in full; in the report for 1882 these reports were published as Appendix No. 6; in the annual reports of the Survey from 1883 to 1889, inclusive, the annual reports of the assistant in charge of office and topography and of the hydrographic inspector appear as Appendices Nos. 4 and 5; in the annual report for 1890 Appendix No. 4 contains the annual report of the assistant in charge of the office, Appendix No. 5 the annual report of the hydrographic inspector, Appendix No. 6 the annual report of the disbursing agent, and Appendix No. 7 the annual report of the assistant in charge of the office of weights and measures.

It has not been deemed advisable to add to the length of this List by including these office reports, embodying as they do much matter relating to routine operations and details of value chiefly for official reference.

The office of standard weights and measures was organized under the Superintendent of the Coast Survey in 1831, and its reports have been issued regularly since 1837 as a part of his official report. They are therefore contained in the following list of reports.

Many individual scientific papers on standards based on the work of this office were printed as appendices in the report of the Superintendent of the Survey. All of them will be found grouped under the subject headings "Standards" and "Weights and measure office" in the Catalogue (Part II).

On July 1, 1901, the act of Congress approved March 3, 1901, creating the National Bureau of Standards. became fully operative and on that date it became an independent Bureau.

## 1807-16

[Under Treasury department. Period of organization. Reports made through correspondence chiefly. F. R. Hassler in charge of work.]

## 1816

First report of F. R. Hassler, superintendent of the survey of the coast of the United States, to the Secretary of the treasury upon the progress of the work.

21 pp. $22^{cm}$. (Senate doc. 143, 15th Cong., 1st sess. In v. 2.)

Report dated "Newark, New Jersey, 23d Nov. 1816."

Also published in Principal documents relating to the survey of the coast of the United States since 1816. Published by F. R. Hassler, superintendent of the survey. New York, William Van Norden, printer, 1834. pp. 12-36.

## 1817

[Under Treasury department. No report sent to Congress.]

## 1818-32

[Under War department by transfer from Treasury department. Work in abeyance.]

## 1832-33

[Under Treasury department (1832-34). Reorganized by act July 10, 1832. No regular reports other than through correspondence.]

## 1834

[Under Navy department (1834-35) by transfer from Treasury department, in effect March 12, 1834.]

Report [by F. R. Hassler to the Secretary of the navy] upon the works executed for the survey of the coast of the United States, upon the law of 1832, and their junction with the works made in 1817 by and under the direction of F. R. Hassler.

17 pp. $22^{cm}$. (Senate doc. 1, 23d Cong., 2d sess. In v. 1.)

This is the second report and was signed at Washington city, May 17, 1834.

Also published in Rept. Secretary of the navy, 1834, p. 364. Also as House doc. 2, 23d Cong., 1st sess. In v. 1. Also in Principal documents relating to the survey of the coast of the United States since 1816. Published by F. R. Hassler, superintendent of the survey. New York, William Van Norden, printer, 1834. pp. 141-154.

Report of F. R. Hassler as superintendent of the survey of the coast, additional to that dated May 17, containing an account of the progress of that work during the summer and until November of 1834.

17 pp. $22^{cm}$. (Senate doc. 1, 23d Cong., 2d sess. In v. 1.)

This supplemental report was signed at "West Hills, Huntington township, Long Island," Nov. 11, 1834, and was combined with it in the Congressional series.

Also published as House doc. 2, 23d Cong., 1st sess. In v. 1. Also in Rept. Secretary of the navy, 1834, p. 364. Also in Principal documents relating to the survey of the coast. Published by F. R. Hassler. N. Y., 1834. pp. 171-178.

## 1835

Third report of F. R. Hassler as superintendent of the survey of the coast, upon the progress of that work from November, 1834, until May, 1835.

(In Second volume of the principal documents relating to the survey of the coast of the United States from October, 1834, to November, 1835. Published by F. R. Hassler, superintendent of the survey. New York, William Van Norden, printer, 1835. pp. 103–107.

Report signed at "Washington city, May 8th, 1835."
Not printed in Rept. Secretary of the navy, and therefore does not appear in the Congressional series.

Fourth report of F. R. Hassler, as superintendent of the survey of the coast, upon the operations performed in that work between the months of May and December, 1835, with an estimate of the appropriation required for the next year's work.

6 pp. $22^{cm}$. (Senate doc. 1, 24th Cong., 1st sess. In v. 1.)

Report signed at New York, Nov. 22, 1835.
Also published as House doc. 2, 24th Cong., 1st sess. In v. 1. Also in Rept. Secretary of the navy, 1835, p. 380. Also in Second volume of the principal documents relating to the survey of the coast. Published by F. R. Hassler. N. Y., 1835. pp. 151–156.

## 1836

[Under Treasury department for this and all subsequent years. Retransfer from Navy department, in effect March 25, 1836.]

Fifth report of F. R. Hassler, superintendent of the coast survey, and of the construction of standard weights and measures, exhibiting the operations performed in 1836.

(In Documents relating to the construction of standards of weights and measures for the custom-houses from March to November, 1835. By F. R. Hassler, superintendent of the works. N. Y., William Van Norden, printer, 1835. pp. 118–123.)

Report signed at "West Hills, Long Island," Nov. 19, 1836.
Not printed in Rept. Secretary of the treasury, and therefore does not appear in the Congressional series. No separate survey edition.

## 1837

Report from the Secretary of the treasury, transmitting the report of F. R. Hassler, superintendent of the coast survey, and of the fabrication of standard weights and measures ["rendering account of the works of 1837"]. Blair & Rives, printers. [Washington, D. C.]

16 pp. $22^{cm}$. (Senate doc. 79, 25th Cong., 2d sess. In v. 1.)

Sixth report. Signed at "Harrow Hill, near Hempstead Harbor, L. I., November 18, 1837.'
886 additional copies printed for use of Senate. No separate survey edition.
Also published as House doc. 14, 25th Cong., 2d sess. In v. 2.

## 1838

Report from the Secretary of the treasury, transmitting a report from the Superintendent of the coast survey, and of the fabrication of standards weights and measures, showing the progress in those works during the present year. [1838.] Blair & Rives, printers.

7 pp. $22^{cm}$. (Senate doc. 4, 25th Cong., 3d sess. In v. 1.)

F. R. Hassler, superintendent. Seventh report. Dated at "Springfield Mountain Station," Nov. 15, 1838.
No separate survey edition.
No House print found.

## 1839

Letter from the Secretary of the treasury, communicating the annual report of the Superintendent of the coast survey, and of the fabrication of standard weights and measures ["rendering account of the works of 1839"]. Blair & Rives, printers.

8 pp. $22^{cm}$. (Senate doc. 15, 26th Cong., 1st sess. In v. 2.)

F. R. Hassler, superintendent. Report signed at "Station of Willow Grove," Penna., Nov. 16, 1839.
500 additional copies printed. No separate survey edition.
Also published as House doc. 20, 26th Cong., 1st sess. In v. 2.

## 1840

Report from the Secretary of the treasury, transmitting a report of Professor F. R. Hassler, superintendent of the coast survey, and the fabrication of standard weights and measures, &c. ["rendering account of the works of 1840"].

18 pp. $22^{cm}$. (Senate doc. 20, 26th Cong., 2d sess. In v. 2.)

Report signed at "Station Mount Holly, N. J., Nov. 17, 1840."
300 additional copies printed for the Senate. No separate survey edition.
Also published as House doc. 14, 26th Cong., 2d sess.

## 1841

Letter from the Secretary of the treasury, transmitting a report of F. R. Hassler, superintendent of the coast survey, showing the progress made therein up to the present time [December, 1841].

18 pp. 22$^{cm}$. (House doc. 28, 27th Cong., 2d sess. In v. 2.)

Includes "Questions of the resolution of Congress of June 24, 1841, relating to the survey of the coast of the United States, with the answers to the same by F. R. Hassler." Also contains a "List of instruments." This progress report is also the 10th annual report.
Report signed at "Station Yards in Newton Square, Delaware County (Pa.), December 2, 1841."
No separate survey edition.
No Senate print found.

## 1842

Report from the Secretary of the treasury, communicating a report from the Superintendent of the coast survey, and of the fabrication of standard weights and measures [upon the progress of these works in 1842]. Thomas Allen, print. [Washington, D. C. ?]

5 pp. 22$^{cm}$. (Senate doc. 11, 27th Cong., 3d sess. In v. 2.)

F. R. Hassler, superintendent. Report signed at "Pine Hill Station, New Jersey, Nov. 17, 1842."
No separate survey edition.
Also published as House doc. 23, 27th Cong., 3d sess. In v. 2.

## 1843

Letter from the Secretary of the treasury, transmitting a report of the late F. R. Hassler, relative to the operations and condition of the Coast survey [in 1843]. Blair and Rives, printers.

8 pp. 22$^{cm}$. (House doc. 97, 28th Cong., 1st sess. In v. 4.)

Twelfth and last report of Superintendent Hassler, who died Nov. 20, 1843. Report is signed at "Station Bethel, Pennsylvania, November 12, 1843."
Transmitted by the Secretary of the treasury, Jan. 29, 1844.
No separate survey edition.

## 1844

Report of the Secretary of the treasury, communicating a report of the Superintendent of the survey of the coast, showing the progress of the work during the year ending November, 1844. Blair & Rives, print.

22 pp. 4 maps and sketches. 22$^{cm}$. (Senate doc. 16, 28th Cong., 2d sess. In v. 2.)

A. D. Bache, superintendent. Report dated at "Station near Cumberland Hill, R. I., November, 1844."
300* additional copies printed for use of survey. No separate survey edition.
Also published as House doc. 25, 28th Cong., 2d sess. In v. 2.

## 1845

Report from the Secretary of the treasury, communicating a report of the Superintendent of the coast survey, showing the progress of the work under his charge during the year ending November, 1845. Ritchie & Heiss, printers. [Washington, D. C.?]

44 pp. 3 maps and sketches. 22$^{cm}$. (Senate doc. 13, 29th Cong., 1st sess. In v. 3.)

A. D. Bache, superintendent. Report dated at "Bodies island, N. C., November 29, 1845."
250* additional copies printed for use of the survey. No separate survey edition.
Also published as House doc. 38, 29th Cong., 1st sess. In v. 3.

### APPENDICES.

*1, 2. [Miscellaneous correspondence.] pp. 40, 41.

*3. Extract from a letter addressed by Ferd. H. Gerdes, assistant United States Coast survey, to Prof. A. D. Bache, superintendent, containing remarks upon the currents in Mississippi sound, and upon the change in the magnetic variation within short distances in the Gulf of Mexico. pp. 41-43.

*4. [Letter. Commerce of Vineyard Sound.] pp. 43, 44.

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* Exhausted.

## 1846

Report of the Secretary of the treasury, communicating a report of the Superintendent of the coast survey, showing the progress of the survey during the year ending November, 1846. Ritchie & Heiss, print.

74 pp. 8 maps and sketches, 1 diag. $22^{cm}$. (Senate doc. 3, 29th Cong., 2d sess. In v. 2.)

A. D. Bache, superintendent. Report dated at "Cape Ann, Mass., November 25, 1846."
500 additional copies printed, of which 250* for use of the survey. No separate survey edition.
Also published as House doc. 6, 29th Cong., 2d sess. In v. 2.

APPENDICES.

*1–3. [Miscellaneous correspondence.] pp. 44–46.

*4. Letters of Lieutenant Commanding George M. Bache, U. S. Navy, assistant in the Coast survey, to the Superintendent, relating to the exploration of the Gulf stream. pp. 46–53.

*5–7. [Loss of brig Washington.] pp. 53–68.

*8. Letter from Lieut. Com. Patterson, United States Navy, to the Superintendent of the United States coast survey, relating to the tides at the entrance of Mobile bay. pp. 68–70.

*9. [Extract from letter. Life saving incident.] pp. 70, 71.

*10. Report of S. C. Walker, esq., to the Superintendent of the coast survey, in relation to the differences of longitude of Philadelphia and Greenwich, by reduction of observations at Cambridge, Massachusetts. pp. 71, 72.

Reprinted. Rept. 1866, app. 12, pp. 99, 100.

*11. Report of S. C. Walker, esq., to the Superintendent of the coast survey, relating to determinations of differences of longitude by telegraph, etc. pp. 72–74.

On correction for personal equation.
Reprinted. Rept. 1866, app. 13, pp. 100–102. Compare his report on telegraphic longitudes 1848 printed as 13-p. report in 30th Cong., 2d sess., House ex. doc. 21. Also his report dated Nov. 10, 1847, on the same subject printed in Astronomische nachrichten, nr. 632, pp. 119–126.

## 1847

Letter from the acting Secretary of the treasury, communicating the report of the Superintendent of the coast survey, showing the progress of that work ["during the year ending October, 1847"].

88 pp. 11 maps and sketches, 1 diag. $22^{cm}$. (Senate ex. doc. 6, 30th Cong., 1st sess. In v. 3.)

A. D. Bache, superintendent. Report dated at "Agamenticus station, near South Berwick, Maine, November 1, 1847."
1,250 additional copies printed, of which 250* for Superintendent Coast survey. No separate survey edition.

APPENDICES.

*1–18. [Miscellaneous details.] pp. 60–86.

*11. Table showing temperatures at depths below 700 fathoms, taken by Lieut. Com. C. H. Davis in 1845, George M. Bache in 1846, and S. P. Lee in 1847.

See sketch, p. 75.

## 1848

Report of the Secretary of the treasury, communicating a report of the Superintendent of the coast survey, showing the progress of that work during the year ending November, 1848.

120 pp. 12 maps and sketches, 4 diag. $22^{cm}$. (Senate ex. doc. 1, 30th Cong., 2d sess. In v. 1.)

A. D. Bache, superintendent. Report dated at "Bodies island, North Carolina, November 14, 1848."
2,000 additional copies printed, of which 250* for Superintendent of the coast survey. No separate survey edition.
Also published as House ex. doc. 13, 30th Cong., 2d sess. In v. 4.

APPENDICES.

*1–3 bis. [Miscellaneous details.] pp. 70–76.

*4. Recapitulation of results for personal equations, 1844 to 1848, in the order of dates. Extract of report of S. C. Walker. pp. 77–83.

*5–18. [Light-house matters, etc.] pp. 84–112.

*19. Annual report to the Superintendent on longitude computations, by S. C. Walker, assistant United States Coast survey. pp. 112–118.

Reprinted. Rept. 1866, app. 14, pp. 102–105.

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* Exhausted.

## 1849

Letter from the Secretary of the treasury, communicating the report of the Superintendent of the coast survey, showing the progress of that work during the year ending November, 1849.

98 pp. 15 maps and sketches, 2 diag. 22$^{cm}$. (Senate ex. doc. 5, 31st Cong., 1st sess. In v. 5.)

A. D. Bache, superintendent. Report dated at "Mount Independence, near Portland, Maine, October, 1849."

5,500 copies printed, of which 500* for Superintendent of coast survey. No separate survey edition.
Also published as House ex. doc. 14, 31st Cong., 1st sess. In v. 4.

APPENDICES.

*1–4. [Field and office details.] pp. 63–72.

*5. Report of Professor O. M. Mitchel, of Cincinnati, on the mechanical record of astronomical observations. pp. 72–78.

CONTENTS.—Revolving disk; arrangement for recording differences of declination.

*6–19. [Miscellaneous details, light-house matters, etc.] pp. 78–96.

*20. Description of a float for observations of surface currents, by Lieutenant C. P.. Patterson, United States Navy, assistant in the Coast survey. p. 97.

See sketch H bis, current float.

## 1850

Letter from the Secretary of the treasury, transmitting the report of the Superintendent of the coast survey, showing the progress of that work during the year ending November, 1850.

134 pp. 27 maps and sketches. 22$^{cm}$. (House ex. doc. 12, 31st Cong., 2d sess. In v. 4.)

No separate survey edition.
A. D. Bache, superintendent. Report dated at "Webb's station, Anne Arundel county, Md., November, 1850."
Also published as Senate ex. doc. 7, 31st Cong., 2d sess. In v. 4.

APPENDICES.

*1–12. [Miscellaneous details and correspondence.] pp. 64–85.

*6. Extract from the report of W. C. Bond, esq., director of the Cambridge observatory, to the Superintendent of the coast survey, in relation to the difference of longitude between Cambridge and Liverpool observatories. p. 79.

*8. Extracts from the report of Professor A. G. Pendleton, United States Navy, assistant in the Coast survey, to the Superintendent, in regard to the encroachment of the sea on land on the south side of Long Island. pp. 80–81.

*9. Report of H. L. Whiting, esq., assistant United States Coast survey, to the Superintendent, on the progress of Sandy Hook, from 1848 to 1850. pp. 81, 82.

See sketch S B, no. 4, 1851.

*13. Extract from the report of S. C. Walker, esq., assistant United States Coast survey, to the Superintendent, on the telegraphic operations and the computations in his charge. pp. 85–89.

CONTENTS.—I, Experiments for galvanic wave time between Washington and St. Louis; II, attempted experiments on wave time through different conductors; III, experiments with the chemical telegraph line; IV, progress of the researches on the velocity of the galvanic current; the Bond spring governor.
Reprinted. Rept. 1866, app. 15, pp. 106–108.

*14–22. [Field and office details.] pp. 89–105.

*23. Extract from the report of Assistant F. H. Gerdes to the Superintendent of the coast survey, on the reconnaissance of the Florida Keys, etc. pp. 106–110.

*24–30. [Field and office details.] pp. 110–134.

*31. Report accompanying a reconnaissance chart of the western coast of the United States, from Monterey, California, to the mouth of the Columbia river, Oregon, by Lieutenant Commanding W. P. McArthur, United States Navy, assistant in the Coast survey. pp. 119–122.

## 1851

Annual report of the Superintendent of the coast survey, showing the progress of that work during the year ending November, 1851. Washington: Robert Armstrong, printer. 1852.

v, 559 pp. 22$^{cm}$. Accompanying sketches bound separately with title page index. 58 sheets, folded 30$^{cm}$.

A. D. Bache, superintendent. Report dated at "Cape Small Point, Maine, November 5, 1851."
First report issued separately as a Survey publication.
Also published as Senate ex. doc. 3, 32d Cong., 1st sess. In v. 5 and v. 5a. Also as House ex. doc. 26, 32d Cong., 2d sess. In v. 4 and v. 4a.

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*Exhausted.

APPENDICES.

*1-6. [Miscellaneous field and office details.] pp. 108-127.

*7. Notes of a discussion of tidal observations, made in connexion with the Coast survey, at Cat island, in the Gulf of Mexico, by Professor A. D. Bache, superintendent of the coast survey, pp. 127-136.
Contents.—Discussion; table of diurnal and semidiurnal curves.
Sketches H, nos. 2 to 6, inclusive.
Reprinted. Rept. 1866, app. 18, pp. 113-119.

*8. Method used in the Coast survey of showing the results of current observations, by Professor A. D. Bache, superintendent. pp. 136, 137.
Sketch 3 (A, no. 3).

*9. Report of Professor O. M. Mitchel, director of the Cincinnati observatory, to the Superintendent of the coast survey, on a new method of recording differences of north polar distances, or declination, by electro-magnetism. pp. 137-145.

*10. Extracts from the report of Professor Agassiz to the Superintendent of the coast survey, on the examination of the Florida reefs; keys, and coast. pp. 145-160.
Contents.—Topography of Florida; mode of formation of the reef; animal life; the keys; coral reefs ship channel; the mainland; coast survey; physical changes in the Gulf stream; changes in ages to come.
Reprinted. Rept. 1866, app. 19, pp. 120-530.

*11. List of Coast survey maps, sketches, and preliminary charts, engraved and engraving. pp. 160-162.

*12. List of geographical positions determined by the United States Coast survey. pp. 162-442.
Contents.—Method of triangulation and verification; average error; assumed size and form of the globe; station errors; checking of geodetic longitudes by telegraph; longitude of Cambridge from Greenwich; explanation of tables; list.
Errata, 168, 169, 218, 304, 324, 372, 374, 375, 378: 1851, p. viii. Errata, 163, 169, 189, 190, 191, 194, 217, 218, 220, 258, 271, 276, 286, 324, 360, 372, 374, 375, 378, 400, 402, 404, 409, 416, 425, 480: 1853, p. 181. Errata, 185, 252: 1854, p. xii. Errata, 192, 225, 340, 341, 342, 344, 346, 411: 1855, p. xviii.

*13-17. [Light-house matters, etc.] pp. 443-559.

*18. Letter of Sears C. Walker, esq., assistant in the United States Coast survey, to the Superintendent, communicating an arrangement with the president of the Maine telegraph company, to determine the difference in longitude of Cambridge and Halifax. pp. 462, 463.

*19-24. [Letters in regard to navigation.] pp. 463-476.

*25. Report of Sears C. Walker, assistant in the Coast survey, communicating the measures of wave-time made from 1849 to 1851. pp. 476-479.
Contents.—Specifications; tables of results.
Reprinted. Rept. 1866, app. 16, pp. 109-111.

*26. Abstract of reports on longitudes, by Sears C. Walker, assistant in the Coast survey, to the Superintendent. pp. 480, 481.
Contents.—Methods; moon culminations; eclipses; transits; occultations; telegraph.
Reprinted. Rept. 1866, app. 17, pp. 111, 112.

*27. [Letters in regard to light-house matters.] pp. 481, 482.

*28. Extracts from the report of Henry L. Whiting, esq., assistant in the Coast survey, to the Superintendent, on the survey of Beaufort, North Carolina. pp. 482-484.
Contents.—Operative causes of its physical permanency.
Sketch 17 (D, no. 5).

*29, 30. [Letters in regard to aids to navigation, lights, etc.] pp. 485-487.

*31. Report of F. H. Gerdes, esq., assistant in the Coast survey, to the Superintendent, on the reconnaissance of the coast of Florida, from the Suwanee river to the St. Martins reef. pp. 488-494.
Contents.—A, description; B, survey; C, tides and currents; D, railroad across the peninsula; E, light-houses and buoys; F, general remarks on Cedar Keys harbor.
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*32-39. [Letters in regard to light-house matters, field work, etc.] pp. 495-509.

*40. Tribute of respect to the memory of Lieutenant Commanding Wm. P. McArthur, United States navy, assistant in the Coast survey. pp. 509-511.

*41-49. [Letters in regard to light-houses, field work, etc.] pp. 512-528.

*50. Letter of the Superintendent of the coast survey to the Secretary of the treasury, communicating information relating to Trinidad, Humboldt, and San Diego bays. pp. 528-530.
With special reference to San Diego river entrance.
Sketches 6 and 7.
For statistics see Superintendent's report, section C. a.

*51, 52. [Letters in regard to discoveries, etc.] pp. 530-533.

*53. [Report on death of Passed Midshipman William De Koven, U. S. Navy.] p. 533.

*54. [Letters on the loss of the steamer Jefferson.] pp. 533-541.

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* Exhausted.

*55. Report to the Assistant in charge of the Coast survey office on the electrotyping operations of the Coast survey, by George Mathiot, electrotypist. pp. 541–553.

CONTENTS.—Adhesion of deposit to matrix; actions in the electrolytic solution; laboratory apparatus; manipulation.
Sketch 58.
Reprinted. Rept. 1866, app. 20, pp. 130–138.

*56. Report of Lieutenant Washington A. Bartlett, U. S. N., assistant in the Coast survey, to the Superintendent, on the examination of the reefs in Hell Gate channel and changes produced by blasting. pp. 553–558.

Errata, p. ix.

## 1852

Report of the Superintendent of the coast survey, showing the progress of the survey during the year 1852. Washington: Robert Armstrong, public printer. 1853.

vi, 173 pp. 36 maps and sketches, 1 diag. $30^{cm}$.

A. D. Bache, superintendent. Report dated at "Coast survey office (Washington), February 7, 1853."
Also published as Senate ex. doc. 58, 32d Cong., 2d sess. In v. 11. Also as House ex. doc. 64, 32d Cong., 2d sess. In v. 8.

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*1–7. General lists, etc., Coast survey reports and correspondence. pp. 71–111.

*8. Report of Lieut. Washington A. Bartlett, U. S. Navy, assistant in Coast survey, to the Superintendent, on the examination of Pot rock, Hell Gate channel, New York. p. 84.

*9–11. [Reports on discoveries.] pp. 85–87.

*12. Extracts from the report of Assistant F. H. Gerdes, to the Superintendent, of a reconnaissance from the Suwanee river, Florida, to the mouths of the Mississippi, Louisiana. pp. 87–94.

*13. [Report on discoveries.] pp. 95–97.

*14. Extracts from the report of Lieut. James Totten, U. S. Army, assistant in Coast survey, to the Superintendent, on the placing of screw-pile signals along the Florida reef. pp. 97, 98.

*15–17. [Reports on discoveries and field work.] pp. 99–103.

*18. Report of Lieut. Comg. James Alden, U. S. Navy, assistant in the Coast survey, to the Superintendent, on the reconnaissance of the Western coast from San Francisco, south, to San Diego, including the Santa Barbara islands and channel. pp. 104–107.

*19, 20. [Reports on discoveries and field work.] pp. 107–108.

*21. Extracts from the report of Major I. I. Stevens, U. S. Corps of engineers, Assistant in charge of the Coast survey office, to the Superintendent, upon the subject of printing from lithographic transfers. pp. 108–111.

*22. Additional notes of a discussion of tidal observations made in connexion with the Coast survey at Cat island, in the Gulf of Mexico, by Professor A. D. Bache, superintendent U. S. Coast survey. pp. 111–122.

CONTENTS.—Table I, Sketch 1, diurnal and semidiurnal curves deduced from observations, with curves of sines; (A) diurnal wave; heights and times; II, Sketch 2, maximum ordinates of diurnal curve, etc.; III, Sketch 3, effect of sun's declination on height; IV, effect of moon's parallax; V and VI, coefficients; VII, computed diurnal ordinates compared with observations; VIII, Sketch 8, residuals classed by moon's ages; IX, same, corrected by change of cosines; X, difference of diurnal maximum ordinates, from last and from first methods of groups—semidiurnal effect; XI, correction to maximum diurnal ordinate for high-water ordinate; XII to XV, further residual corrections; comparison with hypothesis; (B) semidiurnal curve; XVI, half monthly inequality in height; XVII, discrepancies between observations and formula.
Sketch 25 (H, nos. 5–9).
Errata, pp. 115, 119, 121; 1853, p. 182.

*23–32. [Miscellaneous matters.] pp. 122–133.

*33–52. [Light-house matters.] pp. 133–167.

## 1853

Report of the Superintendent of the coast survey, showing the progress of the Survey during the year 1853. Washington: Robert Armstrong, public printer. 1854.

iv, 87, 186 pp. 49 maps and sketches, 5 diag. $30^{cm}$.

A. D. Bache, superintendent. Report dated at "Mt. Blue station, Franklin county, Maine, November 27, 1853."
Also published as Senate ex. doc. 14, 33d Cong., 1st sess. In v. 13. Also as House ex. doc. 12, 33d Cong., 1st sess. In v. 4.

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*Exhausted.

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*1–6. [Miscellaneous details.] pp. 1–67.

*7. List of geographical positions determined by the United States Coast survey since July, 1850. pp. 14–42.

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*8–25. [Miscellaneous details.] pp. 43–49.

*18. Extracts from the report of Lieut. James Totten, U. S. Army, assistant in the Coast survey, in regard to the climate, soil, and character of the Florida keys. pp. 50, 51.

*26. Tide tables for the United States. pp. 67–70.

For the use of navigators, with description of bench marks, explanations, and examples for use.

*27. On the tides at Key West, Florida, from observations made in connexion with the United States Coast survey, by A. D. Bache, superintendent.—(Communicated by authority of the Treasury department.) pp. 71–76.

Contents.—Table I, half monthly inequality of tides, one year's observations; II, diurnal inequality, with formula; decomposition of the curves of observation; semidiurnal tides; III, first six months; IV, second six months; V, the whole year; diurnal tides; VI, effect of moon's declination; VII, moon's age: changes of mean level; VIII, height of high water referred to moon's age, first and second months; IX, monthly mean level.

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*28. On the tides of the western coast of the United States.—Tides of San Francisco bay, California, by A. D. Bache, superintendent U. S. coast survey. pp. 77–81.

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Results of observations at Rincon point, city of San Francisco.

*29. Notes on the tides at San Francisco, California, by Professor A. D. Bache, superintendent U. S. coast survey. pp. 81, 82.

*30. Extracts from letters of L. F. Pourtales, esq., assistant in the Coast survey, to the Superintendent, upon the examination of specimens of bottom obtained in the exploration of the Gulf stream, by Lieuts. Comg. T. A. M. Craven and J. N. Maffitt, U. S. Navy, assistants in the Coast survey. pp. 82, 83.

*31. Report of Professor Benjamin Peirce, to the Superintendent, on the determination of longitudes from observations of moon culminations. p. 84.

Contents.—On the determination of longitude from observation of moon culminations; standard probable error of observation of interpolated lunar transits; constant errors of epoch and periodical one of half lunations.

*32. Report of Professor W. C. Bond on moon culminations, observed by him during the past year, by the "American method," with remarks on the performance of the "spring governor," the invention of the Messrs. Bond. pp. 84–86.

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*33. Report of Dr. B. A. Gould, jr., to the Superintendent, upon the results of his observations in the determination of the difference of longitude, by telegraph, between Seaton station, Washington, and Charleston, South Carolina. pp. 86–88.

*34. Report of George P. Bond, esq., to the Superintendent of the coast survey, on the computations of the chronometer expeditions for determining the difference of longitude between Cambridge and Liverpool. pp. 88, 89.

Expeditions of 1849, 1850, and 1851.

*35. Letter from John Hewston, jr., esq., to the Superintendent of the coast survey, reporting the results of analyses of two specimens of deposit taken from the boiler of the Coast survey steamer Hetzel. pp. 89, 90.

*36. Notes on lithography and lithographic transfers; by Lieutentant E. B. Hunt, Corps of engineers, assistant in the Coast survey. pp. 90–93.

*37. Letter of Lieutenant E. B. Hunt, U. S. Corps of engineers, assistant in the Coast survey, to the Superintendent, describing an instrument invented and called by him the interranger. pp. 93, 94.

*38. Description, by Lieutenant E. B. Hunt, U. S. Corps of engineers, assistant in the Coast survey, of the self-registering tide-gauge, arranged for the Coast survey by Joseph Saxton, esq. pp. 94–96.

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*39. Tables for projecting maps, with notes on map projections. pp. 96–163.

By C. A. Schott and E. B. Hunt.

Contents.—Map projections classified and defined; Bonne's or modified Flamstead's projection; the polyconic, its properties and varieties; formulas used for the computation of projection tables in use at the Coast survey office; graphic construction of polyconic projections, Coast survey methods; rectangular polyconic method; Tables I-V, measures of length; Table VI, projection tables, giving latitude and longitude arcs and coordinates of curvature, from latitude 24° to 50°.

Errata, 96, 97, 98, 102, 134: 1853, p. 182. Errata, 101, 113, 114, 115, 116, 130, 159: 1854, p. xii. Errata, 132, 137: 1866, p. xx.

Also printed separately.

*40–58. [Miscellaneous correspondence and light-house matters.] pp. 164–181.

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* Exhausted.

## 1854

Report of the Superintendent of the coast survey, showing the progress of the Survey during the year 1854.* Washington: A. O. P. Nicholson, public printer. 1855.

xii, 92, 288 pp. 3 fig., 51 maps and sketches, 7 diag. 30$^{cm}$.

A. D. Bache, superintendent. Report dated at "Ragged Mt. station, near Camden, Maine, November 22, 1854."

Also published as Senate ex. doc. 10, 33d Cong., 2d sess. In v. 12. Also as House ex. doc. 20, 33d Cong., 2d sess. In v. 6.

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*1–13. [Miscellaneous details.] pp. 1–20.

*14. Report of Lieut. Comg. J. N. Maffitt, U. S. N., assistant in the Coast survey, on Beaufort harbor, North Carolina, communicated, by request, to the honorable Secretary of the navy June 12, 1854. pp. 21–23.

Its capacity, changes, and improvements.
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*15–18. [Letters in regard to hydrographic discoveries, etc.] pp. 23–25.

*19. Letter from the Superintendent of the coast survey to the Commissioner of the general land office, communicating the results of the survey of Florida keys, in the vicinity of Key West and Spanish harbor. pp. 25–27.

*20. Extracts from the report of F. H. Gerdes, esq., assistant United States Coast survey, on the reconnaissance of the coast of Louisiana in 1854. pp. 28–30.

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*21. Extracts from report of Assistant W. E. Greenwell on the general features and peculiarities of the coast of lower Texas, with suggestions in regard to facilities for navigation [from the harbor of the Brazos de Santiago to the mouth of the Rio Grande]. pp. 30–31.

*22–28. [Letters in regard to sailing directions, etc.] pp. 31–35.

*29. Extracts from the reports of Assistant G. A. Fairfield and Subassistant Henry Mitchell on the tidal observations made on the south shore of Massachusetts, and in Nantucket and Vineyard sounds. pp. 35–37.

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*30. Report to the Superintendent of the coast survey on tidal and magnetic observations of the western coast of the United States, by Lieut. W. P. Trowbridge, Corps of engineers, assistant in the Coast survey. pp. 37–40.

*31. Reports of the chiefs of divisions [including] report of Mr. George Mathiot, in charge of the electrotype division [on electrotype operations and chemiglyphic or etching experiments]. pp. 40–61.

*32. Description of the Congress map, by Lieut. J. C. Tidball, U. S. A., assistant in Coast survey. pp. 61–63.

Reprinted. Rept. 1855, app. 39.

*33. Comparison of the reduction of horizontal angles by the methods of dependent directions and of dependent angular quantities, by the method of least squares. By Prof. A. D. Bache. pp. 63–70.

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*33s. Adjustment of horizontal angles of a triangulation. By Chas. A. Schott, computing division Coast survey office. pp. 70–86.

*33t. Probable error of observation, derived from observations of horizontal angles at any single station, and depending on directions. [By Chas. A. Schott, computing division.] pp. 86–95.

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*34. Extracts from the abstract of reports [on measurements of heights] made in 1854 by Captain T. J. Cram, Corps of topographical engineers, assistant United States Coast survey, in charge of a secondary triangulation party. pp. 95–103.

Experimental comparison of the methods of measuring heights by leveling, by vertical angles, by the barometer, and by the boiling-point apparatus.
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Errata, p. 102: 1855, p. xix.

*35. Description of the United States Coast survey apparatus for measuring base lines. By Lieut. E. B. Hunt, U. S. A., and assistant United States Coast survey. Communicated to the American association for the advancement of science, by authority of the Treasury department. pp. 103–108.

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* Exhausted.

*36. Letter of Professor Peirce, of Harvard, to the Superintendent of the coast survey, enclosing his report on longitude by moon culminations. pp. 108–120.

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*37. Report of Professor W. C. Bond on moon culminations, observed by him during the past year, by the "American method." p. 120.

Chronometric longitude of Cambridge and probable error.

*38. Report of Professor E. Otis Kendall on the number of moon culminations, etc., observed at the High School observatory, Philadelphia. p. 120.

*39. Discussion by J. E. Hilgard, esq., of the probable error of observation with a twenty-six inch portable transit by Würdemann, from observations of Assistant G. Davidson, in 1853. p. 121.

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*40. Observations on the solar eclipse of May 26, 1854, reported to the Superintendent of the coast survey. pp. 122–127.

Observations made at Brooklyn, Long Island, reported by E. Blunt; at Seaton station, Washington, D. C., by C. O. Boutelle; at Roslyn station, near Petersburg, Va., by L. F. Pourtales; Black Mountain station, Cal., by R. D. Cutts; Benicia, Cal., by Prof. James Nooney; Humboldt bay, Cal., by G. Davidson, assistant.

*41. Report of Dr. B. A. Gould, jr., assistant in the Coast survey, upon telegraphic observations made for difference of longitude between Raleigh, N. C., and Columbia, S. C. pp. 128–131.

*41 [a]. Report to Professor A. D. Bache, LL. D., superintendent of the U. S. Coast survey, containing directions and tables for the use of Peirce's criterion for the rejection of doubtful observations: by Dr. B. A. Gould, jr. pp. 131–138.

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*42. Letter of George P. Bond, esq., assistant astronomer, Harvard observatory, communicating the result of computations of the chronometric expeditions of 1849, 1850, and 1851, with his report upon them. pp. 138–142.

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*43. Table of magnetic declination. pp. 142–145.

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*44. Extracts from reports of Assistant George W. Dean on the establishment of meridian lines at Petersburg, Va., and Raleigh and Wilmington, N. C. p. 146.

*45. Preliminary determinations of cotidal lines on the Atlantic coast of the United States, from the Coast survey tidal observations, by A. D. Bache, superintendent. (Communicated to the American association for the advancement of science, by authority of the Treasury department.) pp. 147–152.

CONTENTS.—Table I, observations for cotidal hours; II, cotidal hours of ports on the Atlantic coast; III, rate and trend of cotidal lines.
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*46. Comparison of the diurnal inequality of the tides at San Diego, San Francisco, and Astoria, on the Pacific coast of the United States, from observations in connection with the Coast survey, by A. D. Bache, superintendent. (Communicated to the American association for the advancement of science, by authority of the Treasury department.) pp. 152–155.

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*47. On the distribution of temperature in and near the Gulf stream, off the coast of the United States, from observations made in the Coast survey. By A. D. Bache, superintendent. (Communicated to the American association for the advancement of science, by authority of the Treasury department.) pp. 156–161.

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*48. Report of Chas. A. Schott, esq., of the computing division U. S. Coast survey, on the currents of Nantucket shoals. pp. 161–166.

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*49. Discussion of currents in Muskeget channel and off the northeast coast of Martha's Vineyard, by Charles A. Schott. pp. 166–168.

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* Exhausted.

*50. Report on the tidal currents of Long Island sound and approaches: by Charles A. Schott. pp. 168–179.

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*51. Tide tables for the coast of the United States. pp. 180-189.

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*52. [Cards from current bottles.] pp. 189, 190.

*53. Description of a tide-gauge used at stations on the open seacoast, and in situations exposed to strong currents: By Henry Mitchell, subassistant U. S. Coast survey. pp. 190, 191.

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*54. Letter from Lieutenant Commanding T. A. Craven, U. S. N., assistant in the Coast survey, to the Superintendent, in relation to a specimen-box for bringing up the bottom in deep-sea soundings, with a description and drawings. pp. 191, 192.

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*55. Letter of Assistant J. E. Hilgard, on the action of sea-water upon metals used in the construction of instruments, and on magnetic needles. pp. 192, 193.

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*56. Letter from George Mathiot, esq., containing a detailed description of his self-sustaining voltaic battery. pp. 193, 201.

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*57. Report on engraving in relation to the Coast survey. By Lieutenant E. B. Hunt, Corps of engineers U. S. Army, and assistant U. S. Coast survey. pp. 201–212.

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Errata, p. 204. See index of errata.

*58–73. [Miscellaneous correspondence and light-house matters.] pp. 212–229.

## 1855

Report of the Superintendent of the coast survey, showing the progress of the Survey during the year 1855.* Washington: Cornelius Wendell, printer. 1856.

xx, 420 pp. 1 fig., 54 maps and sketches, 6 diag. $30^{cm}$.

A. D. Bache, superintendent. Report dated at "Mount Harris station, near Dixmont, Penobscot county, Maine, October 23, 1855."
Also published as Senate ex. doc. 22, 34th Cong., 1st sess. In v. 17. Also as House ex. doc. 6, 34th Cong., 1st sess. In v. 3.

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*1–5. [Field and office details.] pp. 105–116.

*6. List of capes, headlands, islands, harbors, and anchorages on the western coast of the United States, of which either the geographical positions have been determined, topographical surveys made, or charts or sketches issued, to date of report of 1855. p. 117.

*7. Results of the Coast survey at different periods from 1844 to 1855. p. 118.

*8. List of geographical positions determined by the United States Coast survey and continued from the reports of 1851 and 1853. pp. 119–148.

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*9. General list of Coast survey discoveries and developments to 1854, inclusive. pp. 148–152.

*10–14. [Letters communicating discoveries, progress of work, etc.] pp. 152–155.

*15. Letter to the Superintendent from Lieut. Comg. J. N. Maffitt, U. S. Navy, assistant in the Coast survey, transmitting his comparative chart of Maffit's channel, Charleston harbor. pp. 155–157.

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*16. Report made to the Superintendent by Lieutenant James Totten, U. S. Army, assistant in the Coast survey, on the erection of screw-pile beacons on Florida reefs, with descriptions of the signals. pp. 157–160.

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*17–20. [Letters communicating discoveries.] pp. 160–162.

*21. Report of Assistant F. H. Gerdes on topography executed by his party on Manhattan island, and on the shores of East and North rivers, including the city of New York. pp. 162, 163.

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*22. Report of Assistant S. A. Gilbert, on the topographical work executed by his party on the western and southern side of Long Island. p. 164.

*23. Report of Assistant A. M. Harrison, on topography executed by his party on the coast of New Jersey, from the head of Raritan bay to Shrewsbury inlet, including Sandy Hook and the Highlands of Navesink. pp. 164, 165.
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*25. Report to the Commissioner of the general land office on the survey of the Florida keys. pp. 171–176.
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*26. Extracts from a descriptive report made to the Superintendent by Assistant George Davidson, upon localities on the western coast of the United States from the north entrance of Rosario strait, W. T., to the southern boundary of California. pp. 176–185.

*27. [Letters relative to Bodega bay and South Farallon island.] pp. 185, 186.

*28. Extracts from the report of Subassistant W. M. Johnson, relative to the features of Santa Cruz island, the valley of San Buenaventura, and the coast north of Santa Barbara channel. pp. 186–188.

*29. Letter of Commander James Alden, U. S. N., assistant in the Coast survey, communicating information relative to the coast, harbors, and commerce of Washington territory. pp. 188–192.

*30. Catalogue of sailing directions, dangers, etc. pp. 193–200.

*31. Report of Portland [Maine] harbor commission. pp. 200–219.
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*32. [Report of field and office work.] pp. 220–222.

*33. Report of Subassistant H. Mitchell, on tidal observations made in Nantucket sound. pp. 222, 223.
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*34. Report of Lieutenant W. P. Trowbridge, U. S. Engineers, assistant in the Coast survey, relative to the tidal and magnetic operations by the party under his charge on the western coast. pp. 223–227.

*35–38. [Reports of field and office work.] pp. 227–253.

*39. Description of the Congress map, by Lieut. J. C. Tidball, U. S. A., assistant in the Coast survey. pp. 253–255.
First printed in Rept. 1854, app. 32.

*40. Solutions of normal equations by indirect elimination. By Chas. A. Schott, computing division. pp. 255–264.

*41. Letter to the Superintendent from Assistant C. O. Boutelle, with description of the apparatus devised for the measurement of preliminary bases at Savannah, Georgia, and Georgetown, South Carolina. pp. 264–267.
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*42. Report of the method of determining longitudes by occultations of the Pleiades. By Professor Benjamin Peirce, LL. D., of Harvard. pp. 267–274.
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*43. Report of Professor W. C. Bond, on the number of moon culminations observed at Cambridge, Mass., and relative to the chronometer expedition for difference of longitude between Cambridge and Liverpool. pp. 275, 276.
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*44. Letter to the Superintendent from Assistant George W. Dean, communicating description of the zenith telescope made by Mr. Wm. Würdemann, 1855, and used at the astronomical station, Dixmont, Maine. pp. 276–278.

*45. Report of Mr. Charles A. Schott, computing division, Coast survey office, on a comparison of star-places given in Rümker's and the Twelve-year catalogues. (Communicated to the Astronomical journal by authority of the Treasury department.) pp. 278–286.
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*46. Report of Dr. B. A. Gould, jr., assistant, on telegraphic operations for difference of longitude between Columbia, South Carolina, and Macon, Georgia. pp. 286–295.
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* Exhausted.

*47. Table of magnetic declinations, observed in the Coast survey, with notes by A. D. Bache, superintendent of the coast survey, and J. E. Hilgard, assistant, accompanied by a map. pp. 295–306.

Discussion of magnetic declination for 1844–45: (1) Northern part of the Gulf of Mexico; (2) Atlantic coast; (3) Pacific coast.
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*48. Report to the Superintendent of the U. S. coast survey of a discussion of the secular variation in the magnetic declination on the Atlantic and part of the Gulf coast of the United States, by Charles A. Schott, chief of computing division, U. S. Coast survey office. (Communicated to the American association for the advancement of science, by authority of the Treasury department.) pp. 306–337.

Comprises the period from 1717–1855
This (with supplements in Rept. 1856, app. 31, and Rept. 1859, app. 24) is the first of the following series of editions: Ed. 2, Rept. 1874, app. 8; ed. 3, Separate pub. (1879); ed. 4, Rept. 1879, app. 9; ed. 5, Rept. 1882, app. 12; ed. 6, Rept. 1886, app. 12; ed. 7, Rept. 1888, app. 7; ed. 8, Rept. 1895, app. 1.
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*49. Results of observations made by Chas. A. Schott, esq., computing division Coast survey office, for magnetic declination, dip, and horizontal intensity. p. 337.

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*50. Approximate cotidal lines of the Pacific coast of the United States, from observations in the United States Coast survey, by A. D. Bache, superintendent. (Communicated to the American association for the advancement of science, under authority of the Treasury department.) pp. 338–342.

Tidal observations.—Table I, tide stations on the western coast of the United States; II, data for cotidal lines of the Pacific coast of the United States; cotidal hours; cotidal groups; III, discussion of the middle group between Cape Mendocino and Point Conception.—Chart of cotidal lines.
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*51. Notice of earthquake waves on the western coast of the United States, on the 23d and 25th December, 1854. (Communicated to the American association for the advancement of science, by A. D. Bache, superintendent, under authority of the Treasury department.) pp. 342–346.

Contains also computation of ocean depth.
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Errata, pp. 342, 345: 1855, p. xviii.

*52. Notice of the tidal observations made on the coast of the United States on the Gulf of Mexico, and type curves at the several stations, showing their decomposition into the curves of diurnal and semidiurnal tides; by A. D. Bache, superintendent. (Communicated to the American association for the advancement of science, under authority of the Treasury department.) pp. 346, 347.

*53. Tide tables, for the use of navigators; prepared from the Coast survey observations by A. D. Bache, superintendent. (Prepared by authority of the Treasury department, for E. and G. W. Blunt, New York.) pp. 347–359.

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Errata, 349, 351, 353, 354, 358: 1857, p. xviii.

*54. Copy of card contained in a current-bottle thrown over near Sandy Hook, from the U. S. Coast survey steamer Gallatin, Lieut. Comg. M. Woodhull, and picked up on the bar at Santa Cruz, one of the western islands [of the Azores]. p. 359.

*55. Letter from Professor J. W. Bailey, U. S. Military academy, at West Point, relative to the characteristics deducible from specimens of bottom, brought up in sounding the Florida section of the Gulf stream. p. 360.

*56. Letter from Lieutenant Commanding B. F. Sands, U. S. N., assistant in the Coast survey, transmitting drawings of an instrument for procuring specimens of bottom in sounding. p. 361.

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*58. Letter of Assistant John Farley, communicating description and drawing of a convenient signal for observing on secondary stations. pp. 363, 364.

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*59. Extract of a letter from Commander B. F. Sands, U. S. Navy, assistant in the Coast survey, communicating a description of the revolving heliotrope devised by him for geodetic purposes. p. 364.

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*61. On a new voltaic experiment made with reference to the time required to produce the maximum intensity of a voltaic current; communicated to the Superintendent by George Mathiot, electrotypist. pp. 366–368.

*62. Letter of George Mathiot, esq., electrotypist Coast survey office, communicating an improved method for taking entire casts from detached plates by the electrotype process. p. 369.
A method for joining detached plates.

*63. On a method of measuring electrical currents of great quantity; by George Mathiot, esq., chief of the electrotype division of the Coast survey office. pp. 370–373.
Mathiot's branch circuit galvanometer.

*64. Abstract of a complete historical account of the progress of discovery on the western coast of the United States from the earliest period; compiled, under direction of the Superintendent, by J. G. Kohl. pp. 374, 375.

*65. Observations on the physical geography and geology of the coast of California, from Bodega bay to San Diego. (Prepared for Prof. A. D. Bache, superintendent of the United States coast survey, by William P. Blake.) pp. 376–398.
CONTENTS.—Physical geography of the mountain ranges adjoining the coast; geology of the principal bays and ports from Point Reyes to San Diego.
Errata, pp. 379, 380, 382, 387, 388, 392, 394, 395, 396: 1857, p. xviii.

*66. Explosion of boiler on steamer Hetzel. pp. 398–400.

*67–86. [Letters relating to discoveries and light-house matters.] pp. 400–416.

## 1856

Report of the Superintendent of the coast survey, showing the progress of the survey during the year 1856. Washington: A. O. P. Nicholson, printer. 1856.
xx, 358 pp. 2 figs., 58 maps and sketches, 9 diag. $30^{cm}$.
A. D. Bache, superintendent. Report dated at "Coast survey office, Washington, D. C., December, 1, 1856."
Also published as Senate ex. doc. 12, 34th Cong., 3d sess. In v. 15. Also as House ex. doc. 18, 34th Cong., 3d sess. In v. 4.

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*19. [Reports on office work.] pp. 137–163.

*20. Report of Dr. B. A. Gould, jr., assistant in charge of telegraph operations for determining difference of longitude between Wilmington, N. C., and Montgomery, Ala., with list of stars for observation. pp. 163–166.

*21. Report to the Superintendent by Assistant George W. Dean on details of the method adopted for telegraphic operations to determine difference of longitude, with descriptions of the instruments and means employed. pp. 167–181.
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*22. Extract from the report of Professor W. C. Bond, on moon culminations, observed for Coast survey purposes, and relative to results of the chronometer expeditions between Cambridge and Liverpool, for difference of longitude. p. 181.

*23. Letter to the Superintendent, transmitting report of G. P. Bond, esq., on the results of the chronometric expedition of 1855, for difference of longitude between Cambridge, Mass., and Liverpool. Report on the computation of the results of the chronometric expedition of 1855, between Cambridge and Liverpool. pp. 182–191.
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*24. Report on the method of determining longitudes by occultations of the Pleiades. By Professor Benjamin Peirce, LL. D., of Harvard. pp. 191–197.
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*26. Report of Assistant George Davidson upon observed occultations of α Scorpii and of the planet Mars, at Point Hudson, Port Townshend, Washington territory, in April and May, 1856. pp. 203–208.

Tables and remarks.

*27. Method of observing azimuth employed at Cat Island, by J. E. Hilgard, assistant U. S. Coast survey. pp. 208, 209.

*28. On the general distribution of terrestrial magnetism in the United States, from observations made in the U. S. Coast survey and others: by A. D. Bache, superintendent, and J. E. Hilgard, assistant, U. S. Coast survey. pp. 209–225.

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*29. Report of Assistant Charles A. Schott, on magnetic observations made at stations in Delaware, Maryland, and Virginia. pp. 226, 227.

Methods used in observations of the present year. Magnet H.

*30. Results of observations made by Assistant Charles A. Schott, computing division, Coast survey office, for magnetic declination, dip, and horizontal intensity, in Section III, 1856. p. 227.

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*31. An attempt to determine the secular change of the magnetic declination on the western coast of the United States: by Chas. A. Schott, in charge of the computing division, Coast survey office. pp. 228–235.

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Period 1792–1855.
Considered a supplement to Rept. 1855, app. 48.

*32. Discussion of the secular variation of the magnetic inclination in the northeastern states: by Chas. A. Schott, in charge of the computing division, Coast survey office. pp. 235–245.

CONTENTS.—Toronto, Canada; Albany and Greenbush, N. Y.; Cambridge, Mass.; Providence, R. I.; West Point and Cold Spring, N. Y.; New Haven, Conn.; New York, N. Y.; Philadelphia, Pa.; Washington, D. C.; Baltimore, Md.; recapitulation of results.—Table I, geographical positions and number of dip observations; II, formula for each station; III, probable error, epoch of minimum dip, and annual variation in current year.
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*34. Notes on the progress made in the Coast survey, in prediction tables for the tides of the United States coast, by A. D. Bache, superintendent United States Coast survey, etc. (Communicated to the American association for the advancement of science, by authority of the Treasury department.) pp. 249–251.

*35. Approximate co-tidal lines of diurnal and semidiurnal tides of the coast of the United States on the Gulf of Mexico, by A. D. Bache, superintendent United States Coast survey. (Communicated by authority of the Treasury department to the American association for the advancement of science.) pp. 252–260.

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*37. Report of Subassistant H. Mitchell on the progress of the discussion of the interference tides of Nantucket and Martha's Vineyard sound. pp. 261–263.

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*38. Observations to determine the cause of the increase of Sandy Hook, made by the Coast survey, for the Commissioners on harbor encroachments of New York,—by Professor A. D. Bache, superintendent United States coast survey. pp. 263, 264.

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*39. Report of Subassistant H. Mitchell on the investigation of the tides and tidal currents of New York harbor and its dependencies, and at Sandy Hook. pp. 264–266.

*40. Report of G. Würdemann on tidal observations made at stations between New York city and Albany, on Hudson river. pp. 266, 267.
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*42. Report of Lieutenant W. P. Trowbridge, U. S. Engineers, assistant in the Coast survey, on the method pursued in conducting tidal observations on the western coast of the United States. pp. 269, 270.

*43. On the effect of winds in varying the level of the water in Albemarle sound, by L. F. Pourtales, assistant in the Coast survey. pp. 271, 272.
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*44. Notes on the winds of the coast of the United States on the Gulf of Mexico, by A. D. Bache, superintendent United States Coast survey. pp. 272–276.
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*48. Report of Mr. A. Boschke, on the progress made in special topography in connection with maps of New York harbor, undertaken by the Coast survey for the Commissioners on harbor encroachments. pp. 281, 282.
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*49. Report of Lieut. Comg. Stephen D. Trenchard, U. S. N., assistant in the Coast survey, transmitting results of the hydrographic survey of St. Simons sound and Brunswick harbor, Ga. pp. 282, 283.

*50–51. [Reports on field work.] pp. 284–286.

*52. Report to the Commissioner of the general land office, showing the progress made during the season in the survey and marking of the Florida Keys. pp. 286–289.

*53–55. [Reports on Florida harbors, etc.] pp. 289–291.

*56. Extract from a report of Assistant J. E. Hilgard to the Superintendent on the progress of the triangulation in Mississippi sound and Lake Borgne. pp. 291, 292.
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*57. Letter of Commander James Alden, U. S. N., assistant, Coast survey, transmitting a communication from H. A. Goldsborough, esq., in relation to the resources of Washington territory. pp. 293–295.

*58. Table for projecting maps of large extent, arranged by Assistant J. E. Hilgard. 296–307.
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*59. Communication from Assistant Charles A. Schott, of the computing division, Coast survey office, on the determination of the probable error of an observation from the differences of the observations from their arithmetical mean. pp. 307, 308.
Article from Astronomische nachrichten, nr. 1034, translated by C. A. Schott.

*60. Description of an apparatus for measuring subsidiary base-lines. pp. 308–310.
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*61. Method of testing a repeating theodolite, illustrated by Assistant J. E. Hilgard. pp. 310–316.
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*Exhausted.

*62. Report of George Mathiot, on the results of an experiment made in printing maps from their electrotyped plates. pp. 316, 317.
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*63. Letter to the Superintendent, communicating results of analysis made of specimens of the water of New York harbor, by Professor Wolcott Gibbs. pp. 317, 318.

*64. Letter to the Superintendent from Professor Wolcott Gibbs, communicating results of examinations made of sands taken from the sites of Coast survey bases at Key Biscayne (Cape Florida) and Cape Sable. pp. 318, 319.

*65. Abstract of an historical memoir concerning the progress of exploration on the Atlantic coast of the United States, from its discovery to the present time. (Prepared by Dr. J. G. Kohl, for the archives of the U. S. Coast survey.) pp. 319–322.

*66. Abstract of an historical account of explorations made on the coast of the Gulf of Mexico, from the earliest times to the present. (Prepared for the archives of the United States Coast survey, by Dr. J. G. Kohl.) pp. 322–324.

*67. Report on an index of reference to memoirs of papers on subjects related to the Coast survey operations, by Lieut. E. B. Hunt, U. S. Corps of engineers, assistant U. S. Coast survey. pp. 325–330.

*68. On systematizing the abbreviations of titles of periodicals, transactions, etc., by Lieutenant E. B. Hunt, U. S. Corps of engineers. 331–333.

*69–77. [Miscellaneous correspondence.] pp. 333–348.

*78–86. [Light-house matters.] pp. 349–356.

## 1857

Report of the Superintendent of the coast survey, showing the progress of the survey during the year 1857.* Washington: James B. Steedman, printer. 1858.
xviii, 448 pp. 1 fig., 62 maps and sketches, 8 diag. 30cm.
A. D. Bache, superintendent. Report dated at "Coast survey office, Bangor, Maine, November 3, 1857." Also published as Senate ex. doc. 33, 35th Cong., 1st sess. In v. 15. Also as House ex. doc. 21, 35th Cong., 1st sess. In v. 6.

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*1–12. [Field and office details.] pp. 121–150.
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*21. Report made to the Superintendent, showing the least water in channel entrances to certain harbors, rivers, and anchorages on the coasts of the United States; prepared by Lieut. W. D. Whiting, and revised by Lieutenants Commanding J. J. Almy and T. A. Craven, U. S. N., assistants in the Coast survey. Tidal data by Assistant L. F. Pourtales, in charge of tidal division. pp. 178–184.

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*25. List of geographical positions determined by the United States Coast survey, and continued from reports of 1851, 1853, and 1855. pp. 264–301.

*26. Notes on the measurement of a base for the primary triangulation of the eastern section of the coast of the United States, on Epping plains, Maine, by A. D. Bache, superintendent United States coast survey. (Communicated by authority of the Treasury department to the American association for the advancement of science.) pp. 302–305.

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*27. Report of Dr. B. A. Gould, jr., assistant, on the progress made in telegraph campaigns for differences of longitude, and the preparation of results for publication. pp. 305–310.

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*28. Report of Professor W. C. Bond, director of Harvard college observatory, Cambridge, Massachusetts, on the moon culminations and other phenomena observed for the Coast survey. pp. 310, 311.

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*29. Report of Prof. Benjamin Peirce, LL. D., on the determination of longitudes by occultations of the Pleiades and solar eclipses. pp. 311–314.

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*30. Notice of the determination of the longitude of Fernandina, Amelia island, Florida, by means of chronometer exchanges from Savannah, Georgia, by A. D. Bache, superintendent, and Charles A. Schott, assistant, United States Coast survey. (Communicated by authority of the Treasury department to the American association for the advancement of science.) pp. 314–324.

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*31. Account of the method and formulæ for the determination of the astronomical latitude by means of the zenith telescope, as used in the survey of the coast of the United States. pp. 324–334.

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*32. Report of Assistant Chas. A. Schott upon the gradual loss of magnetism of the several magnets in use in the survey of the coast. pp. 334–342.

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*33. On the heights of the tides of the Atlantic coast of the United States, from observations in the Coast survey, by A. D. Bache, superintendent. (Communicated by authority of the Treasury department to the American association for the advancement of science.) pp. 342–347.

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*35. Report of Subassistant H. Mitchell on observations of tides and currents in Nantucket and Marthas Vineyard sounds, and in the East river at Hell Gate, with remarks on the revision of levelings on Hudson river. pp. 350–354.

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*36. On the winds of the western coast of the United States, from observations in connection with the United States Coast survey, by A. D. Bache, superintendent. (Communicated by authority of the Treasury department to the American association for the advancement of science.) pp. 354–358.

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*37. Report to the Commissioners on the preservation of New York harbor from encroachment, by the advisory council on the comparative map of New York bay and harbor and the approaches; prepared by the Coast survey, March, 1857, including extracts from the report of A. Boschke, esq., United States Coast survey, to Professor A. D. Bache, superintendent, February, 1857. pp. 358–373.

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*38. Report of Mr. A. Boschke on the drawing of maps of New York harbor, made for the Commissioners on harbor encroachments. pp. 373, 374.

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* Exhausted.

*39. Report made by Lieutenant A. W. Evans, U. S. A., assistant, Coast survey, on a topographical reconnaissance of a part of Sapelo island, Georgia, for the selection of a site for a primary base line. pp. 374–377.

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*41. Report of Capt. J. H. Simpson, U. S. Topographical engineers, assistant in the Coast survey, on the reconnaissance and progress made in triangulation for an air line between Fernandina and Cedar Keys, Florida. pp. 379–382.

*42. Report to the Commissioner of the general land office, showing the progress made in the survey and marking of the Florida keys, in quarter sections, during the present season. pp. 382–390.

*43. Extract from the report of Subassistant W. M. Johnson, on the topographical features of the coast adjacent to Santa Barbara channel, California. pp. 390, 391.

*44. Report of Assistant W. E. Greenwell, on the survey, character, and resources of the islands and main adjacent to Santa Barabara channel, California. pp. 392–395.

*45. Description of an apparatus for measuring subsidiary base lines. pp. 395–398.

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Reprinted separately in 1876, but without appendix number.

*46. Description of deep-sea sounding apparatus invented by Commander B. F. Sands, U. S. N., assistant in the Coast survey. p. 398.

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*47. Notes by Lieutenant E. B. Hunt on a new sounding apparatus proposed by him for Coast survey use. pp. 398–401.

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*48. Report of Lieutenant Commanding W. G. Temple, United States Navy, assistant Coast survey, on the result of trials made with the new sounding apparatus devised by Lieutenant E. B. Hunt, United States Engineers. pp. 401, 402.

*49. Description of the tide-gauge devised by Lieutenant Commanding S. D. Trenchard, U. S. N., assistant in the Coast survey. pp. 402, 403.

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*50. Letter from the Superintendent, communicating the description of a tide-gauge devised by Subassistant H. Mitchell for taking observations in deep water. pp. 403, 404.

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*51. Report of Lieutenant E. B. Hunt, U. S. Engineers, assistant in the Coast survey, on the preparation of an index of scientific references. pp. 404–414.

*52. Report of J. G. Kohl, esq., on the method, scope, and completion of a history of maritime discovery and exploration on the western coast of the United States, prepared for publication with the records of the United States Coast survey. pp. 414–433.

*53, 54. [Miscellaneous correspondence.] pp. 434–437.

*55–65. [Light-house matters.] pp. 438–445.

## 1858

Report of the Superintendent of the coast survey, showing the progress of the Survey during the year 1858.* Washington: William A. Harris, printer. 1859.

xxi, 463 pp. 2 fig., 39 maps and sketches, 1 diag. 30$^{cm}$.

A. D. Bache, superintendent. Report dated at "Superintendent's office, Cheshire, Conn., October 28, 1858."
Also published as Senate ex. doc. 14, 35th Cong., 2d sess. In v. 16. Also as House ex. doc. 33, 35th Cong., 2d sess. In v. 6.

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*1–12. [Field and office details.] pp. 121–150.

*13. Report of Lieut. Comg. T. B. Huger, U. S. N., assistant in the Coast survey, showing the result of comparisons of the hydrographic surveys, made in December, 1856, and March, 1858, at the entrances to Cape Fear river, N. C. pp. 150, 151.

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Sketches 12 and 13.

*14–19. [Field and office details.] pp. 151–184.

*20. On a supposed personal equation in the use of the zenith telescope for determining latitudes by Talcott's method, by A. D. Bache, superintendent United States Coast survey. (Communicated by authority of the Treasury department to the American association for the advancement of science.) pp. 184–186.

Table showing results of observations for personal equations.

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* Exhausted.

*21. Method of computing longitude, from moon culminations. pp. 186–189.
Notes on observations of moon culminations; forms and example.

*22, 23. [Statistics of astronomical observations.] pp. 189–191.

*24. Continuation of the list of magnetic stations and results given in appendix No. 28, Coast survey report of 1856. pp. 191, 192.

*25. Rediscussion and development of an intermediate period in the secular change of the magnetic declination at Hatboro', Pennsylvania. By Chas. A. Schott. pp. 192–195.
CONTENTS.—Discussion and development of an intermediate period.—Table of declinations from 1680 to 1850.
Diagram.
Errata, p. 193: 1858, p. xxi.

*26. Report to the Superintendent by Assistant Charles A. Schott, on the progress made in discussing the secular variation of magnetic declination and dip for Washington city, D. C. pp. 195–197.
Declination from 1809 to 1857; dip from 1839 to 1858.

*27. On the tidal currents of New York harbor near Sandy Hook, by A. D. Bache, superintendent United States Coast survey. (Communicated by authority of the Treasury department to the American association for the advancement of science.) pp. 197–203.
CONTENTS.—On the character of the tidal currents in the vicinity of the bar: (1) Normal currents at the entrance to New York bay; (2) False Hook channel and the approaches; (3) currents of Sandy Hook bay.—Tables I to IV, lunar time, duration, velocity, and direction of currents; V and VI, velocities corrected for diurnal and half-monthly inequalities.
Sketch 39.

*28. Report of Assistant H. Mitchell, on the investigation of currents in the East river, at Hell Gate and Throg's Neck, the sub-currents of New York bay and harbor, and levelings on the banks of the Hudson river. pp. 204–207.

*29. [Report on tidal work.] pp. 208–210.

*30. The co-tidal lines of an enclosed sea, derived from the equilibrium theory. By Professor Benjamin Peirce. pp. 210–213.
CONTENTS.—(1) General theory; (2) its modification by the incompleteness of the inclosure.

*31. On the dynamics of ocean currents. By Lieut. E. B. Hunt, Corps of engineers, U. S. A. pp. 213–216.

*32. On some anomalies in the Florida Gulf stream, and on their further investigation. By Lieut. E. B. Hunt, Corps of engineers, U. S. A. pp. 217–222.
Changes of current depending upon the winds and seasons.

*33, 34. [Report on explorations, Georgia and Florida.] pp. 222–224.

*35. Report to the Commissioner of the general land office, showing the progress made during the surveying year in the survey and marking in quarter sections of the Florida keys. pp. 225–227.

*36. [Extracts from the report on field work, Florida peninsula.] pp. 227, 228.

*37. Investigation of the laws of motion governing the descent of the weight and line in deep-sea soundings; by Prof. W. P. Trowbridge, assistant in the Coast survey. pp. 228–246.
CONTENTS.—Formulæ of velocity of descent; influence of lengths at different depths; ratio of descent, velocity, resistance to sinker and line, and weight of line in water, from observations made by Joseph Dayman.
Sketch 38.
Errata, p. 235: 1858, p. xxi.

*38. Apparatus for harbor soundings, proposed by Lieut. E. B. Hunt, and constructed for the use of the United States Coast survey. pp. 247, 248.
Report by J. M. Batchelder. Combined sounding apparatus and tide meter. Notes on its principles and application.

*39. Report of Assistant L. F. Pourtales on the progress made in the microscopical examination of specimens of bottom from deep-sea soundings. pp. 248–250.
Green and ochraceous incrustation of foraminifera, and jet tint of specimens.

*40. Review by Professor W. P. Trowbridge, assistant in the Coast survey, relating to the origin, cost, and progress of foreign geodetic surveys, with other data for comparison with the results of the United States Coast survey. pp. 251–270.
CONTENTS.—Trigonometrical surveys of England, Ireland, and Scotland; hydrography of England; analysis of the report of the select committee appointed to consider the Ordnance survey of Scotland, etc., 1856; France; India; Russia; Prussia; table of statistics of topographical maps in Europe; recapitulation; marine disasters—United States vessels, 1855, 1856, and 1857; imports, exports, tonnage, etc.; Great Britain, 1852 to 1855; Gulf of Mexico shipping; Florida reef.

*41. Comparison of the cost and progress of the United States Coast survey during the periods from 1832 to 1844, and from 1844 to 1856–57, by Prof. W. P. Trowbridge, assistant in the Coast survey. pp. 270–273.

*42. List of papers accompanying a special report. . . . p. 274.

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* Exhausted.

*43. Tide tables for the use of navigators, prepared from the Coast survey observations by A. D. Bache, superintendent. (Furnished by authority of the Treasury department to E. & G. W. Blunt, New York, and revised October, 1858.) pp. 275–297.

1 fig.

*44. Directory for the Pacific coast of the United States. By Assistant George Davidson. pp. 297–458.

*45–50. [Light-house matters.] pp. 459–463.

## 1859

Report of the Superintendent of the coast survey, showing the progress of the Survey during the year 1859. Washington: Thomas H. Ford, printer. 1860.

xvi, 370 pp. 1 fig., 35 maps and sketches, 4 diag. $30^{cm}$.

A. D. Bache, superintendent. Report dated at "Coast survey station, Cooper, Washington county, Maine, September 23, 1859."
Also published as House ex. doc. 41, 36th Cong., 1st sess. In v. 7.

APPENDICES.

*1–13. [Field and office details.] pp. 108–136.

1 fig.

*14. Tide tables for the use of navigators, prepared from the Coast survey observations by A. D. Bache, superintendent. (Furnished by authority of the Treasury department to E. & G. W. Blunt, New York, and revised October, 1859.) pp. 136–167.

1 fig.
Errata, p. 145: 1860, p. xx.

*15. Table showing the least water in the channels of certain rivers, harbors, and anchorages on the coasts of the United States; reprinted from the list of 1857 and revised, with additions and tidal data. pp. 168–171.

*16. Table for navigators, showing the variation of the compass for the year 1858, compiled from the general chart of F. J. Evans, R. N. pp. 172–175.

Sketch 38.

*17. [Reports on office work.] pp. 176–212.

*18. List of registered topographical sheets received subsequent to 680. pp. 212–214.

*19. List of registered hydrographic sheets received subsequent to 632. pp. 215, 216.

*20. List of geographical positions determined by the United States Coast survey, and continued from reports of 1851, 1853, 1855, and 1857. pp. 216–277.

*21. [Letter on moon culminations, Cincinnati.] p. 278.

*22. Discussion of the magnetic and meteorological observations made at the Girard college observatory, Philadelphia, in 1840, 1841, 1842, 1843, 1844, and 1845. Part I. Investigation of the eleven-year period in the amplitude of the solar-diurnal variation, and of the disturbances of the magnetic declination. By A. D. Bache, LL. D. pp. 278–295.

CONTENTS.—Introduction; separation of disturbances and establishment of normal readings of the declinometer; analytical expressions of the regular solar-diurnal variation of the declination; inequality of the amplitude due to the eleven (or ten) year period; discussion of the number of disturbances of the declination—their annual inequality; diurnal inequality of the number of disturbances of the declination; deflections by disturbances—their mean annual amount—effect of the eleven (or ten) year period; deflections by disturbances—their mean diurnal amount; connection of the frequency of the solar spots with the changes in the amplitude of the diurnal variation of the declination.
1 diag.
Errata, pp. 279, 280, 293: 1860.
Also published in Smithsonian contributions to knowledge, v. 11, no. 113. This and other parts were also assembled and published by the Smithsonian institution in monographic form under the above series title.

*23. Results reported from the observations made by Assistant Charles A. Schott, for magnetic declination, dip, and horizontal intensity, in Sections I and II, and Canada, 1859. p. 296.

CONTENTS.—New England, New York, and Canada; results of observations made by him in Canada, Maine, New Hampshire, Vermont, Massachusetts, and Connecticut; footnote on disturbances.

*24. Report of Assistant Charles A. Schott on the latest results of the discussion of the secular change of the magnetic declination, accompanied by tables showing the declination (variation of the needle) for every tenth year from the date of the earliest reliable observation, for twenty-six stations on the Atlantic, Gulf, and Pacific coasts of the United States. pp. 296–305.

CONTENTS.—Formulas expressing secular change, used for calculating the tabular values for Group I, stations between Portland, Me., and Williamsburg, Va., with table of observations made between 1680 and 1860; for Group II, southern stations and western coast; record of all observed declinations made use of in the above paper not heretofore published in the Coast survey reports.
Considered a supplement of ed. 1, Rept. 1855, app. 48, and Rept. 1856, app. 31. For ed. 2 see Rept. 1874, app. 8; ed. 3, Separate pubs. (1879); ed. 4, Rept. 1879, app. 9; ed. 5, Rept. 1882, app. 12; ed. 6, Rept. 1886, app. 12; ed. 7, Rept. 1888, app. 7; ed. 8, Rept. 1895, app. 1.

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*Exhausted.

*25. Gulf stream explorations.—Third memoir: Distribution of temperature in the water of the Florida channel and straits: By A. D. Bache, supt. U. S. Coast survey. (Communicated by authority of the Treasury department to the American association for the advancement of science.) pp. 306–310.

CONTENTS.—Form of bottom; change of temperature with depth; temperature in a direction across the stream; bands of warm and cold water; the "cold wall;" longitudinal section; effects of pressure on Saxton's deep-sea thermometer, under pressure and free from pressure; thermometers nos. 5 and 10.
Sketch 35.

*26. Report of Assistant Henry Mitchell on the physical surveys of New York harbor and the coast of Long Island, with descriptions of apparatus for observing currents, etc. pp. 311–317.

Sketch 40.
Errata, p. 317: 1860, p. xx.

*27. [Report on office work.] pp. 317–320.

*28. Circulars found in current bottles thrown from the surveying steamer Corwin in 1857 and 1859, in the vicinity of the Florida reef. pp. 320, 321.

*29–31. [Report of explorations, South Carolina, Georgia, Florida.] pp. 321–324.

*32. Extracts from the report of Assistant S. A. Gilbert, descriptive of the coast of Texas intervening between Matagorda bay and Corpus Christi. pp. 324–328.

Report on a reconnaissance.

*33. Tables for projecting maps of large extent, arranged by J. E. Hilgard, U. S. C. S. pp. 328–358.

CONTENTS.—Table I, length in metres of 1° of latitude and longitude, values of the corresponding radii of the developed parallel, and angles at each pole for 10° of longitude; II, coordinates of curvature.

*34. Description of an apparatus devised by Assistant W. P. Trowbridge, and of the method of applying it in determining ocean depths and obtaining specimens of bottom. pp. 359–364.

Sketch 39.
Errata, p. 359: 1860, p. xx.

*35. Extracts from letters of J. M. Batchelder, esq., stating the results of trials made with Hunt's tide-metre at Charlestown navy yard, Mass. pp. 365, 366.

*36–39. [Miscellaneous correspondence.] pp. 367–369.

*40–43. [Light-house matters.] pp. 369, 370.

## 1860

Report of the Superintendent of the coast survey, showing the progress of the Survey during the year 1860. Washington: Government printing office. 1861.

xx, 409 pp. 1 fig., 22 maps and sketches, 8 diag. 30cm.

A. D. Bache, superintendent. Report dated at "Coast survey office, Washington, D. C., December 15, 1860."
Also published as House ex. doc. 14, 36th Cong., 2d sess. In v. 7.

APPENDICES.

*1–15. [Field and office details.] pp. 105–131.

1 fig.

*16. Tide tables for the use of navigators, prepared from the Coast survey observations by A. D. Bache, superintendent. (Furnished by authority of the Treasury department to E. &. G. W. Blunt, New York, and revised October, 1860.) pp. 131–164.

1 fig.
Errata, p. 161: 1860, p. xx.

*17. Lecture on the Gulf Stream, prepared at the request of the American association for the advancement of science. By A. D. Bache, superintendent U. S. Coast survey. pp. 165–176.

CONTENTS.—General account of the methods used in developing its hydrography, and summary of results obtained: (1) Instruments for temperatures; for depth; for obtaining specimens of the bottom; (2) plan of the work; (3) method of discussion of results; (4) results; type curves of law of temperature, with depth at the most characteristic positions; type curves of law of distribution of temperature across the stream; curves of temperature at the same depths; curves of depths at the same temperatures; Table I, distance of the cold wall from the shore, and widths of the several bands of cold and warm water of the Gulf Stream, measured on the lines of the sections; (5) limit of accuracy of the determinations; II, probable uncertainty in the determination of maximum and minimum points by running the same sections over in different years, by different observers; III, value of probable error of determination of the bands for each section and the average of the whole; (6) figure of the bottom of the sea below the Gulf Stream; (7) general features of the Gulf Stream.
Sketches 19 to 22.

*18. [Report on tidal work.] pp. 177–179.

*19. [Report on office work.] pp. 179–216.

*20. Reports of Assistant H. L. Whiting, on topographical contour, hydrographic details, and reduction, on photography, and on the scale of shades suitable for complete maps. pp. 216–229.

CONTENTS.—On the contouring and reduction of maps; on the scale of shades, and on the application of photography in preparing details for the engraver; (1) generalization of contour and other natural features for reduction to 1-80,000 contour; salt marsh; sand beaches and sand hills; woods; fresh marsh; shore line; low water; (2) hydrographic reductions; (3) reductions by photography; (4) scale of shades; report of E. Hergesheimer, assistant.

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* Exhausted.

*21. A resolution providing for the observation of the eclipse of the sun on the 18th day of July, 1860. Report to the Superintendent of the United States coast survey on the expedition to Labrador to observe the total eclipse of July 18, 1860, organized under act of Congress approved June 15, 1860, by Professor Stephen Alexander, LL. D., of the College of New Jersey. pp. 229–275.

CONTENTS.—Tabular comparison of chronometers; arrangement and programme; description of the telescopes employed; synopsis of the observations; times of contacts; same in local mean time (civil reckoning); other observations; reports from special parties; earth temperature (Aulezavik); atmospherical electricity; icebergs, mirage, etc.; triple rainbow; auroras; table of meteorological observations; observations with Arago's polariscope; report of photographers; changes of illumination; seamen's observations; winds; magnetic elements; longitude by chronometers.

4 fig., sketch 39.
Errata, 239, 275: 1860, p. XX.

*22. An account of the solar eclipse of July, 1860, as observed for the United States Coast survey near Steilacoom, Washington territory, by Lieut. J. M. Gilliss, U. S. Navy. pp. 275–292.

CONTENTS.—Preliminary; table of meteorological observations on Muck prairie; latitude observations; time observations; chronometer errors and rates; longitude; the eclipse; reports from special parties.

1 diag.

*23. Discussion of the magnetic and meteorological observations made at the Girard college observatory, Philadelphia, in 1840, 1841, 1842, 1843, 1844 and 1845. Part II.—Investigation of the solar-diurnal variation in the magnetic declination, and its annual inequality. By A. D. Bache, LL. D. pp. 293–312.

CONTENTS.—Investigation of the solar-diurnal variation of the declination; its semiannual inequality; analytical and graphical exhibition of the solar-diurnal variation for each month, summer, winter, and year; maxima and minima, and times of average value of the declination; diurnal range; annual variation of the declination.

1 diag.
Also published in Smithsonian contributions to knowledge, v. 13, no. 121. This and the other parts were also assembled and published by the Smithsonian institution in monographic form under the above series title.

*24. Discussion of the magnetic and meteorological observations made at the Girard college observatory, Philadelphia, in 1840, 1841, 1842, 1843, 1844, and 1845. Part III.—Investigation of the influence of the moon on the magnetic declination. By A. D. Bache, LL. D. pp. 312–324.

CONTENTS.—Lunar influence on the magnetic declination; tabulation of results according to the moon's hour angle; comparison of lunar-diurnal variation for three epochs; resulting lunar-diurnal variation; inequality in the lunar-diurnal variation; investigation of deflections depending upon lunar phases; variation in declination and in parallax.

1 diag.
Also published in Smithsonian contributions to knowledge, v. 13, no. 132.

*25. Results of observations made on solar spots during the first seven months of the year 1860, by C. A. Schott, assistant in the Coast survey. pp. 324–326.

*26. Report on the magnetic station at Key West, Florida reef, by Prof. W. P. Trowbridge, assistant Coast survey. pp. 326–349.

CONTENTS.—Description of observatory, with results; declinometer, recording cylinder, and clock; vertical-force magnetometer; adjustments; mean daily range of temperature for each month, 1851, 1852, and monthly range for four years; mean monthly temperature for fourteen years; lamps; scale measurements; temperature coefficients of the horizontal and vertical forces of magnets; photographic arrangements; magnet H—axis and intensity; dip; scale values for intensity magnets—tables and computation; experiments for temperature coefficients of horizontal-force magnet, with hot water and ice.

Sketches 23 and 24.

*27. Description of the magnetic station at Eastport, Maine, by Assistant L. F. Pourtales. pp. 350, 351.

*28. Continuation of the list of magnetic stations and results given in appendices 28, Coast survey report of 1856, and 24, Coast survey report of 1858. pp. 351, 352.

Declination, dip, and intensity at various stations. (Supplementary to 1856, p. 227, and 1858, p. 191.)

*29. Results reported from the observations made by Assistant Charles A. Schott, for magnetic declination, dip and horizontal intensity, on Cape Cod peninsula, Long Island, and the coast of New Jersey. p. 352.

*30–34. [Reports on field work. Florida and Texas.] pp. 353–357.

*35. Supplement to appendix 61 in C. S. report for 1856, on the "Method of testing a repeating theodolite." pp. 357–361.

CONTENTS.—Table I, readings of every 10° on the circle and determination of angular distance of verniers; II, determination of eccentricity; III, residual errors of graduation and readings.

*36. Formulæ, tables, and example for the geodetic computation of latitudes, longitudes, and azimuths of trigonometrical points, as used by the United States Coast survey. pp. 361–391.

Tables for each minute of latitude from 23° to 50°.

*37. Account of Cauchy's interpolation formula. Prepared by Charles A. Schott, assistant Coast survey. pp. 392–396.

*38. Table showing the height in feet corresponding to a given angle of elevation and a given distance in metres, for use in the construction of contour lines by the plane-table. Prepared by Charles A. Schott, assistant United States Coast survey. p. 397.

CONTENTS.—Height in feet corresponding to a given angle of elevation and a given distance in metres, for use in the construction of contour lines by plane tables.

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* Exhausted.

*39. Description of implements devised by Assistant Henry Mitchell for collecting specimens of bottom in alluvial harbors. p. 398.
Sketch 40.

*40. Description of the method of applying a new form of dividers invented by Mr. John R. Gilliss for the graphical decomposition of tidal curves. By L. F. Pourtales. pp. 398, 399.
1 diag.

*41. Report of Lieut. Comg. Alexander Murray, U. S. N., assistant Coast survey, relative to the Labrador eclipse expedition, and to incidental results bearing on the hydrography of the coast of Labrador. pp. 399–402.
1 sketch.

*42. Notes on the geology of the coast of Labrador, by Oscar M. Lieber, esq., August, 1860. pp. 402–408.
1 sketch.

*43–45. [Light-house matters.] pp. 408, 409.

## 1861

Report of the Superintendent of the coast survey, showing the progress of the Survey during the year 1861. Washington: Government printing office. 1862

viii, 270 pp. 1 fig., 29 maps and sketches, 2 diag. 30$^{cm}$.

A. D. Bache, superintendent. Report dated at "Coast survey office, Washington, D. C., December 15, 1861."
Also published as House ex. doc. 70, 37th Cong., 2d sess. In v. 6.

APPENDICES.

*1–8. [Field and office details.] pp. 77–98.
1 fig.

*9. Tide tables for the use of navigators, prepared from the Coast survey observations, by A. D. Bache, superintendent. (Furnished by authority of the Treasury department to E. and G. W. Blunt, New York, and revised May, 1861.) pp. 98–131.
1 fig.

*10. [Report on tidal work.] pp. 132–135.

*11. Report of Professor W. P. Trowbridge, assistant Coast survey, with results of experiments made with an instrument devised by him to register depths in sounding, and distance as a log at sea. pp. 135–139.

*12. [Report on office work.] pp. 140–176.

*13. List of registered topographical sheets received subsequent to no. 754. pp. 176–178.

*14. List of registered hydrographic sheets received subsequent to no. 683. pp. 179–180.

*15. Experiments to determine the relative shrinkage and expansion of parchment paper and backed antiquarian paper. pp. 180, 181.
Sketch 31.

16. Report upon the determination of the longitude of America and Europe from the solar eclipse of July 28, 1851. By Professor Benjamin Peirce, LL. D., etc. pp. 182–195.
CONTENTS.—Observations of the total phase; European observations, of which the beginning and the end, both observed at the same place, have been admitted into the computation; American observations; method of computation.

17. Report of Professor Benjamin Peirce, LL. D., on an example for the determination of longitudes by occultations of the Pleiades. pp. 196–221.
CONTENTS.—Example showing the mode of computation; Greenwich, Cambridge (England), Ashurst, Washington city, Philadelphia, and Boston observatories computed; solutions of the equations for the correlation of the moon's place and of the longitude.

18. Abstract of the report of Dr. B. A. Gould, assistant Coast survey, on the determination of longitude at Albany, N. Y., by the telegraphic method. pp. 221–232.
CONTENTS.—Abstract of a report on the determination by telegraph of the difference of longitude between New York city and Albany; table of instrumental corrections; collimation and azimuth correction, and hourly clock-rate; personal equations; comparative table of longitude results at the two stations.

19. Observations of the solar eclipse of 1860, July 18, made at the Coast survey station, Gunstock mountain, New Hampshire, by Professor A. D. Bache, superintendent United States Coast survey. pp. 232–239.
CONTENTS.—(1) dispositions; (2) first contact; (3) positions of spots; I, table of observations, July 17; II, July 18, before; III, during; IV, after the eclipse; (4) occultation of spots; (5) last contact; (6) phenomena.
Sketch 29.
Errata, 232: 1862, front leaf.

20. Observations of the solar eclipse of July 18, 1860, made at the Coast survey office, Washington, D. C., by Charles A. Schott, assistant United States Coast survey. pp. 239–241.
CONTENTS.—First contact; last contact; after the eclipse; heliographic position of the spots.
1 diag.

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* Exhausted.

21. Observations of the solar eclipse of July 18, 1860, made at Cambridge, Massachusetts, by B. A. Gould, assistant United States Coast survey. pp. 241, 242.

22. Discussion of the secular change of the magnetic intensity (horizontal and total) on the Atlantic, Gulf, and Pacific coasts of the United States. By Assistant Charles A. Schott. pp. 242–251.

23. New discussion of the distribution of the magnetic declination on the coast of the Gulf of Mexico, with a chart of the isogonic curves for 1860. By Assistant Charles A. Schott. pp. 251–256.
1 map.

*24. New discussion of the distribution of the magnetic declination on the coast of Virginia, North Carolina, South Carolina, and Georgia, with a chart of the isogonic curves for 1860. By Assistant Charles A. Schott. pp. 256–259.
1 map.

25. Report on observations of the solar spots made at the Coast survey office, Washington, D. C., from August, 1860, to December, 1861, both inclusive, by Charles A. Schott, assistant United States Coast survey. pp. 259–261.
CONTENTS.—Table from August, 1860, to December, 1861, and monthly relative numbers, compared with Wolf's revised numbers; spotless days.
Sketch 29.

*26–29. [Reports on field work -Florida and Texas.] pp. 261–264.

*30. Extracts from a report by Subassistant J. S. Lawson, showing the general character of Koos bay, Oregon. pp. 264, 265.
1 map.

*31–33. [Special service of Survey parties with Army and Navy.] pp. 265–269.

*34. [Light-house matters.] pp. 269, 270.

## 1862

Report of the Superintendent of the coast survey, showing the progress of the Survey during the year 1862.* Washington: Government printing office. 1864.

xix, 434 pp. 1 fig., 40 maps and sketches, 3 diag. $30^{cm}$.
A. D. Bache, superintendent. Report dated at "Coast survey station, near West Cheshire, Connecticut, November 7, 1862."
Also published as House ex. doc. 22, 37th Cong., 3d sess. In v. 9.

APPENDICES.

*1–4. [Field and office details.] pp. 67–155.
1 fig.

*5. Table showing the least water in the channels of certain harbors, rivers, and anchorages on the coasts of the United States; reprinted from the list of 1859 and revised with additions and tidal data. pp. 86–92.

*6, 7. [Notices to mariners.] p. 93.

*8. Tide tables for mariners, prepared from the Coast survey observations, by A. D. Bache, superintendent. (Furnished by authority of the Treasury department to E. & G. W. Blunt, New York, and revised October, 1862.) pp. 93–126.
1 fig.

*9. Additional researches on the cotidal lines of the Gulf of Mexico, by A. D. Bache, superintendent. pp. 126, 128.
Tables of diurnal and semidiurnal tides.
Sketch 46.

*10. [Report on tidal work.] pp. 128, 129.

*11. [Report on office work.] pp. 129–155.

*12. Report of Professor Benjamin Peirce, of Harvard, on the computations of the occultations of the Pleiades for longitude. pp. 155, 156.
Longitude of America from Europe.

*13. Upon the tables of the moon, used in the reduction of the Pleiades, by Professor Benjamin Peirce, of Harvard. pp. 157, 158.
On their progressive improvements.

*14. Report of Dr. B. A. Gould on the progress of computations for deducing longitude from observations by telegraph between Calais, Me., and New Orleans, La. pp. 158–160.

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* Exhausted.

*15. Discussion of the magnetic and meteorological observations made at the Girard college observatory, Philadelphia, in 1840, 1841, 1842, 1843, 1844, and 1845. Part IV.—Investigation of the eleven (or ten) year period, and of the disturbances of the horizontal component of the magnetic force. By A. D. Bache, LL. D., superintendent United States Coast survey. pp. 161–186.

CONTENTS.—Instrumental notice; correction of readings for changes of temperature; scale values; correction for progressive instrumental change; hourly normals for each month; horizontal intensity; absolute value; effect of the loss of magnetism of the bar; secular change; separation of the larger disturbances; corrected normals; investigation of the eleven (or ten) year periods, from changes in the amplitude of the solar-diurnal variation; eleven (or ten) year inequality, as indicated by the disturbances; analysis of the disturbances; annual and diurnal variation; classification of disturbances according to their magnitude.

Sketch 48.

Errata, pp. 178, 182: 1862, p. iv.

Also published in Smithsonian contributions to knowledge, v. 13, no. 162. This and the other parts were also assembled and issued by the Smithsonian institution in monographic form under the above series title.

*16. Discussion of the magnetic and meteorological observations made at the Girard college observatory, Philadelphia, in 1840, 1841, 1842, 1843, 1844, and 1845. Part V.—Investigation of the solar-diurnal variation, and of the annual inequality of the horizontal component of the magnetic force. By A. D. Bache, LL. D., superintendent United States Coast survey. pp. 186–202.

CONTENTS.—Preparation of hourly normals for each month; regular solar-diurnal variation; semiannual inequality in the diurnal variation; analysis of the solar-diurnal variation; epochs of maxima and minima; amplitude; epochs of average value; annual variation of the force.

Sketch 48.

Also published in Smithsonian contributions to knowledge, v. 13, no. 162. This and the other parts were also assembled and issued by the Smithsonian Institution in monographic form under the above series title.

*17. Discussion of the magnetic and meteorological observations made at the Girard college observatory, Philadelphia, in 1840, 1841, 1842, 1843, 1844, and 1845. Part VI.—By A. D. Bache, LL. D., superintendent United States Coast survey. Investigation of the influence of the moon on the magnetic horizontal force. pp. 202–212.

CONTENTS.—Number of observations for lunar discussion and their distribution according to western and eastern hour angles of the moon; differences from monthly normals, arranged for moon's hour angles; lunar-diurnal variation for two periods; lunar-diurnal variation in summer and winter; analysis of the lunar-diurnal variation; investigation of the horizontal force in reference to lunar phases; influence of the moon's changes of declination; influence of the moon's changes of distance.

1 diag.

Also published in Smithsonian contributions to knowledge, v. 13, no. 162. This and the other parts were also assembled and issued by the Smithsonian institution in monographic form under the same general title.

*18. Results from observations made by Assistant Charles A. Schott, in July and August, 1862, for magnetic declination, dip, and horizontal intensity in Pennsylvania, including also one station in the District of Columbia and one in New York. p. 212.

*19. Abstract of results of a magnetic survey of Pennsylvania and parts of adjacent states in 1840 and 1841, with some additional results of 1843 and 1862. By A. D. Bache, superintendent United States Coast survey. pp. 212–229.

CONTENTS.—Declinations observed by him in 1840 and 1841; tabular comparison of secular changes in 1840, 1841, and 1862; chronometric results for longitude; geographical positions; distribution of declination for 1842.0; general table of results referred to common epoch, 1842.0; comparison of observed and computed values; dip, distribution of, and isoclinal lines for 1842, Groups 1 to 4; correction to epoch; comparison of observed and computed dip; horizontal intensity and isodynamic lines for 1842; tabular formation of groups for the analytical expression of the distribution of horizontal force referred to 1842.0; comparison of observed and hypothetical computed values; representation of the total force.

Sketch 47.

The complete paper, including records and results, published in Smithsonian contributions to knowledge, v. 13, no. 166. Also collected with other parts and published as a monograph with above series title.

*20. Continuation of the list of magnetic stations and results given in appendices 28, Coast survey report of 1856; 24, Coast survey report of 1858; and 28, Coast survey report of 1860. pp. 230, 231.

*21. Report on observations of the solar spots, made at the Coast survey office, Washington, D. C., from January to August, 1862, inclusive, by Assistant Charles A. Schott. (Additional to appendix 25, Coast survey report for 1861.) pp. 231, 232.

*22. Development of Bessel's function for the effect of periodic forces, for durations of periods frequently occurring in meteorological and magnetical investigations; with examples. Communicated by Charles A. Schott, assistant United States Coast survey. pp. 232–235.

*23. Description of a new mode of constructing the axle of a magnetic dipping needle. By Assistant J. E. Hilgard. pp. 236–238.

*24. Notice of earthquake waves on the western coast of the United States, on the 23d and 25th December, 1854. (Communicated to the American association for the advancement of science, by A. D. Bache, superintendent, under authority of the Treasury department.) pp. 238–241.

Reprint of a paper deducing the depth of the Pacific ocean from the effect of the Simoda earthquake on the tide gauges in California and Oregon in 1854.

Sketch 50.

*25. On the origin, growth, substructure, and chronology of the Florida reef. By Captain E. B. Hunt, Corps of engineers, U. S. A. pp. 241–248.

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* Exhausted.

*26. Results of experiments for determining the length of the six-metre standard bar, and its rate of expansion by heat. Reported by Assistant J. E. Hilgard. pp. 248–255.

Table of comparisons of standard bar with six metres.
Sketch 49.

*27. Comparison of the effect of atmospheric moisture on the dimensions of different kinds of drawing paper. p. 255.

*28–37. [Special duty with armies and blockading squadrons, and other occupation on the Atlantic coast.] pp. 256–265.

*38. List of capes, headlands, islands, harbors, and anchorages on the western coast of the United States, of which either topographical, hydrographic, preliminary, or complete surveys have been made, or maps, charts, or sketches issued. pp. 266–268.

*39. Directory for the Pacific coast of the United States, reported to the Superintendent of the United States coast survey. By George Davidson, assistant. pp. 268–430.

*40. [Obituaries.] pp. 431–434.

## 1863

Report of the Superintendent of the coast survey, showing the progress of the Survey during the year 1863. Washington: Government printing office. 1864.

xiii, 218 pp. 1 fig., 29 maps and sketches, 1 diag. $30^{cm}$.

A. D. Bache, superintendent. Report dated at "Coast survey office, Washington, D. C., December 15, 1863."
Also published as House ex. doc. 11, 38th Cong., 1st sess. In v. 8.

APPENDICES.

*1–11. [Field and office details.] pp. 61–83.

1 fig.

*12. Tide tables for the use of navigators, prepared from the Coast survey observations, by A. D. Bache, superintendent. (Furnished by authority of the Treasury department to E. & G. W. Blunt, New York, and revised, 1863.) pp. 84–117.

*13. [Report on tidal work.] pp. 117–118.

*14. [Report on office work.] pp. 119–142.

*15. [List of registered topographical sheets received subsequent to no. 844.] pp. 143, 144.

*16. [List of registered hydrographic sheets received subsequent to no. 738.] pp. 145, 146.

*17. Reports of Professor Benjamin Peirce, of Harvard, upon the occultations of the Pleiades, in 1841 and 1842. pp. 146–154.

CONTENTS.—On computations for longitude, Nos. I, II, and V; records of Edinburgh, Washington, and Cambridge observations; ephemeris; stereographic coordinates of the moon referred to Alcyone; equations for the correction of the moon's place and of the longitude; solutions.

*18. Report of Dr. B. A. Gould, on the computations connected with observations by the telegraphic method for difference of longitude. pp. 154–156.

*19. Discussion of the magnetic and meteorological observations made at the Girard college observatory, Philadelphia, in 1840, 1841, 1842, 1843, 1844, and 1845. Part VII.—Investigation of the eleven-year period, and of the disturbances of the vertical component of the magnetic force, with a supplement on the effect of auroral lights, by A. D. Bache, LL. D. pp. 156–183.

CONTENTS.—Instrumental notice; determination of the effect of changes of temperature, scale values, reduction of observations to a uniform temperature; recognition and separation of the larger disturbances; investigation of the eleven (or ten) year period, in the amplitude of the diurnal variation; investigation of the eleven (or ten) year period, in the disturbances, and their general analysis; annual inequality in the number and amount of disturbances; diurnal inequality of the disturbances; classification of the disturbances according to their magnitude; appendix—effect of the aurora borealis on the declination, the horizontal, and vertical force.
Sketch 30.
Also published in Smithsonian contributions to knowledge, v. 14, no. 175. This and the other parts were also assembled and issued by the Smithsonian institution in monographic form under the above series title.

*20. Discussion of the magnetic and meteorological observations made at the Girard college observatory, Philadelphia, in 1840, 1841, 1842, 1843, 1844, and 1845. Part VIII.—Investigation of the solar-diurnal variation and of the annual inequality of the vertical component of the magnetic force. By A. D. Bache, LL. D. pp. 183–195.

CONTENTS.—Preparation of hourly normals for each month and year; regular solar-diurnal variation; semiannual inequality of the diurnal variation; analysis of the diurnal variation; maxima and minima; ranges; epochs of average force; annual inequality of the vertical force.
Sketch 30.
Also published in Smithsonian contributions to knowledge, v. 14, no. 175. This and the other parts were also assembled and issued by the Smithsonian institution in monographic form under the above series title.

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* Exhausted.

*21. Discussion of the magnetic and meteorological observations made at the Girard college observatory, Philadelphia, in 1840, 1841, 1842, 1843, 1844, and 1845. Part IX.—Investigation of the influence of the moon on the magnetic vertical force. By A. D. Bache, LL. D., superintendent United States Coast survey. pp. 196–204.

CONTENTS.—Number of observations for lunar discussion; distribution according to eastern and western hour-angles; differences from monthly normals, arranged for moon's hour-angles; lunar-diurnal variation in summer and winter; analysis of the lunar-diurnal variation of the vertical force; lunar effect upon inclination and total force.

1 diag.

Also published in Smithsonian contributions to knowledge, v. 14, no. 175. This and the other parts were also assembled and issued by the Smithsonian institution in monographic form under the above series title.

*22. Results reported from observations made by Assistants Charles A. Schott and G. W. Dean for magnetic declination, dip, and horizontal intensity, in Maine and Connecticut, including also a station in the District of Columbia. p. 204.

*23. Report on preliminary experiments made by Assistant George W. Dean to determine the variations of "induction time" in relay magnets now in use. p. 205.

*24. Report by Assistant J. E. Hilgard, on the trial of Harrison's globe lens at the United States Coast survey office, previous to its use in the photograph division. pp. 206, 207.

*25. Titles of scientific papers communicated by the late Major E. B. Hunt, United States Engineers, and published either in the Coast survey reports or with the Proceedings of the American association for the advancement of science. pp. 207, 208.

*26–28. [Special duty with armies and blockading squadrons, and other occupation on the Atlantic coast.] pp. 208–216.

*29. [Light-house matters.] pp. 217, 218.

## 1864

Report of the Superintendent of the coast survey, showing the progress of the Survey during the year 1864. Washington: Government printing office. 1866.

xiii, 315 pp. 3 fig., 36 maps and sketches, 3 diag. 30$^{\text{cm}}$.

A. D. Bache, superintendent. Report dated at "Cambridge, Mass., October 26, 1864."
Also published as House ex. doc. 15, 38th Cong., 2d sess. In v. 9.

APPENDICES.

*1–6. [Field, hydrographic, and office details.] pp. 39–57.

1 fig.

*7. [Report of field work, North Carolina.] p. 57.

*8. Tide tables for the use of navigators, prepared from the Coast survey observations by A. D. Bache, superintendent. (Furnished by authority of the Treasury department to E. & G. W. Blunt, New York, and revised, 1864.) pp. 58–90.

1 fig.

*9. Report to the Superintendent by Assistant L. F. Pourtales, in charge of the field and office operations relating to tidal observations. [Subtitle.]—On observations of tides at Tahiti, made under the direction of Captain John Rodgers, U. S. N. pp. 91, 92.

Sketch 40.

*10. [Report on office work.] pp. 92–114.

*11. Report of Professor Benjamin Peirce, of Harvard, on computations for longitude from occultations of the Pleiades. p. 114.

*12. Report of Dr. B. A. Gould on the results of computations for longitude by the telegraphic method. pp. 115, 116.

*13. The problem of determining a position by angles observed upon a number of given stations. Solution of Gauss, with example, communicated by Charles A. Schott, assistant Coast survey. pp. 116–119.

*14. Report on the method of reduction, and results of the connexion of the Epping base line with the primary triangulation in the eastern states. By Charles A. Schott, assistant United States Coast survey. pp. 120–144.

CONTENTS.—(1) General remarks on the method of reduction; (2) instruments and methods of horizontal measures employed in the triangulation near the Epping base; (3) determination of probable error and weight to each direction observed with the 30-inch theodolite; station Howard; abstract of remaining differences; abstract of remaining errors; table; (4) determination of probable error and weight to each angle and direction from observations with a repeating circle; (5) resulting horizontal angles from the observations at each station, with their probable error; (6) effects upon the horizontal angles of a difference of level between the stations occupied and observed upon; (7) spherical excess of triangles; (8) residuals in the sum of angles of each triangle, and their discussion; (9) final determination of probable errors (and weights) to each direction; (10) relative value of results from the 30-inch and the 10-inch repeating theodolites; (11) formation of the conditional equation of the nonagon around the Epping base; (12) equation of correlatives and normal equations; (13) resulting correction to the observed directions; (14) complete adjustment of the nonagon and final directions; (15) triangle side computations; (16) resulting distances from Mount Desert to Humpback; (17) connection of the azimuth mark with the adjusted directions.

Errata 143: 1866, p. 141.

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* Exhausted.

*15. List of geographical positions determined by the United States Coast survey, and continued from reports of 1851, 1853, 1855, 1857, and 1859. pp. 144–182.

*16. Discussion of the magnetic and meteorological observations made at the Girard college observatory, Philadelphia, in 1840, 1841, 1842, 1843, 1844, and 1845. Part X.—Analysis of the disturbances of the dip and total force. By A. D. Bache, LL. D., president National academy of sciences, superintendent United States Coast survey. pp. 183–190.

CONTENTS.—Formation of table of disturbances of the two component parts and their combination for dip and total force; analysis of disturbances of the inclination; the annual inequalities in amount and number; eleven (or ten) year inequality; diurnal inequalities, in amount and number; classification of disturbances in dip, according to their magnitude; analysis of disturbances of total force; their annual inequalities, in amount and number; eleven (or ten) year inequality; diurnal inequalities, in amount and number; classification of disturbances in total force

Also published in Smithsonian contributions to knowledge, v. 14, no. 186. This and the other parts were also assembled and issued by the Smithsonian institution in monographic form under the same general title.

*17. Discussion of the magnetic and meteorological observations made at the Girard college observatory, Philadelphia, in 1840, 1841, 1842, 1843, 1844, and 1845. Part XI.—Solar-diurnal variation and annual inequality of the inclination and total force, with diagrams, by A. D. Bache, LL. D., president National academy of sciences, superintendent United States coast survey. pp. 191–199.

CONTENTS.—Combination of the diurnal normals of the two components for dip and total force; solar-diurnal variation of the inclination; its semi-annual inequality; analysis of the solar-diurnal variation of the dip; maxima and minima, ranges and epochs of average value; solar-diurnal variation of the total force; its semi-annual inequality; analysis of the solar-diurnal variation of the total force; annual inequality of the dip and total force.

1 diag.

Also published in Smithsonian contributions to knowledge, v. 14, no. 186. This and the other parts were also assembled and issued by the Smithsonian institution in monographic form under the above series title.

*18. Discussion of the magnetic and meteorological observations made at the Girard college observatory, Philadelphia, in 1840, 1841, 1842, 1843, 1844, and 1845. Part XII.—Declination, inclination, and intensity, between 1841 and 1845. By A. D. Bache, LL. D., president national academy sciences, superintendent United States coast survey. pp. 199–206.

CONTENTS.—Discussion of the magnetic inclination, introductory notice; abstract of observation of dip, monthly means; collection of dip observations at Philadelphia; analytical expression of secular change of dip normal; absolute values of the magnetic declination, dip, horizontal, vertical, and total force for five epochs, and the mean epoch, January, 1843.

Also published in Smithsonian contributions to knowledge, v. 14, no. 186. This and the other parts were also assembled and published by the Smithsonian institution in monographic form under the above series title.

*19. Results of magnetic observations made in the United States by Professor J. N. Nicollet between 1832 and 1836. Communicated by A. D. Bache, LL. D., president National academy of sciences, superintendent United States Coast survey. May, 1864. pp. 207–210.

*20. Report of Assistant George W. Dean on experiments made for determining the "eduction time" of relay magnets or telegraphic "repeaters." pp. 211–220.

1 diag.

*21. Communication on the trajectory of ricochet shot from a 15-inch Rodman gun. By Charles A. Schott, assistant U. S. Coast survey. pp. 220–222.

2 figs.

*22. Report on the determination of ranges of shot from 15 and 20 inch guns. By Charles A. Schott, assistant United States Coast survey. p. 223.

*23, 24. [Light-house matters.] pp. 223–226.

## 1865

Report of the Superintendent of the United States coast survey, showing the progress of the Survey during the year 1865. Washington: Government printing office. 1867.

xii, 231 pp. 9 fig., 3 pl., 26 maps and sketches, 5 diag. $30^{cm}$.

A. D. Bache, superintendent. J. E. Hilgard, acting superintendent. Report dated at "Coast survey office, Washington, D. C., December 16, 1865."

Also published as House ex. doc. 75, 39th Cong., 1st sess. In v. 13.

APPENDICES.

*1–4. [Field and office details.] pp. 37–39.

*5. Extracts from a report by Sub-assistant J. S. Bradford, showing the nature of hydrographic changes at the entrances of Cape Fear river, North Carolina. p. 45.

Sketch 13.

*6. [Report on tidal work.] p. 46.

*7. [Report on office work.] pp. 47–50.

*8. List of original hydrographic and topographic sheets registered in the archives of the United States Coast survey, geographically arranged. pp. 50–99.

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* Exhausted.

*9. List of geographical positions in Sections V, VI, VII, and IX, determined by the United States Coast survey, and continued from Annual report of 1864, appendix no. 15. pp. 99–136.

In South Carolina, Georgia, Florida, Texas, and Indian Territory.

*10. Geographical positions determined approximately in West Virginia, Illinois, Kentucky, Tennessee, Alabama, Mississippi, and Missouri. p. 137.

*11. Type curves of the tides of the Pacific coast of the United States. p. 138.

Sketch 26.

*12. Report on the progress of determining longitude from the occultation of the Pleiades, by Prof. Benjamin Peirce. pp. 138–146.

Values of $\Sigma_2 - p$ for 1838–1842 and 1857–1861.

*13. Method of determining the corrections of lunar semi-diameter, mean place, ellipticity of orbit, longitude of perihelion, coefficient of annual parallax, and longitude of Europe and America from the occultations of the Pleiades, by Prof. Benjamin Peirce. pp. 146–149.

*14. Report on the results of determining longitude by the telegraphic method, by Dr. B. A. Gould. pp. 150, 151.

*15. Report and tables on the declinations of standard time stars, by Dr. B. A. Gould. pp. 152–154.

*16. Report on the positions and proper motions of the four Polar stars, by Dr. B. A. Gould. pp. 155–159.

*17. Report on the latitude of Cloverden station, in Cambridge, by Dr. B. A. Gould. pp. 160–165.

CONTENTS.—Micrometer values; reduction of star observations—tables; discrepancies with uncorrected catalogue places—table; resultant mean places of stars, etc.—table; deduced places for Cloverden station—table; mean error; other determinations.

*18. Results of magnetical observations made at Eastport, Maine, between 1860 and 1864, for the United States Coast survey. pp. 166–174.

CONTENTS.—Declination, diurnal range of; annual inequality (diagram); epochs of greatest diurnal deflection; mean monthly values of declination between August, 1860, and July, 1864; annual effect of the secular change; annual inequality of the declination; same at Toronto; comparative curve.
Sketch 29 (theodolite magnetometer.)
4 fig., 2 pl.

*19. Distribution of the magnetic declination on the coast and parts of the interior of the United States, accompanied by a chart of the isogonic lines for the epoch 1870, and a small chart of isomagnetic lines of equal annual change, by Charles A. Schott, assistant United States Coast survey. pp. 174–176.

Sketches 27 and 28.

*20. Projection table for a map of North America. pp. 176–186.

CONTENTS.—Diagram; table of lengths, in metres, of 5° of latitude on the straight meridian; table of the radii of the parallels, and 5° of longitude on each parallel; I, table of coordinates, latitude 5° to 85°; II, coordinates of curvature, latitude 55° to 89°; III, length, in metres, of 1° of latitude and longitude 55° to 89°.

*21. Results of the primary triangulation of the coast of New England, from the northeastern boundary to the vicinity of New York. pp. 187–203.

CONTENTS.—Length and accuracy of the Fire Island base line; length and accuracy of the Massachusetts base line; length and accuracy of Epping base line; geodetic connection of the three primary base lines in Maine, Massachusetts, and New York; their degree of accordance and resulting accuracy of the primary triangulation intervening; resulting angles and distances of the primary triangulation between the Epping, Massachusetts, and Fire Island base lines.
Errata, 198: 1866, p. 141.

22. On the plane-table and its use in topographical surveying. Assistant A. M. Harrison. pp. 203–231.

CONTENTS.—Description; adjustments; paper; scales; projections for field work; three-point problem; practical modes of determining the position of a fourth point by resection upon three fixed points; Lehmann's method; Netto's method; Bessel's methods; two-point problem; field work; contours; example; table of heights; chain; telemeter; table of reduction of hypothenuse to base; reconnaissance; office work.
Sketches 30, 31, 32.
5 fig.

## 1866

Report of the Superintendent of the United States coast survey, showing the progress of the Survey during the year 1866. Washington: Government printing office. 1869.

xii, 140 pp. 3 fig., 24 maps and sketches, 4 pl., 1 diag. 30cm.

A. D. Bache, superintendent. J. E. Hilgard, acting superintendent. Report dated at "Washington, D. C., December 22, 1866."

Also published as House ex. doc. 87, 39th Cong., 2d sess. In v. 14.

APPENDICES.

*1–4. [Field, hydrographic, and office details.] pp. 27–34.

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* Exhausted.

*5. Report by Henry Mitchell, assistant United States Coast survey, upon soundings across the straits of Florida. pp. 35–44.

Contents.—Northern approach; southern approach; difficulties in the way of laying a telegraph cable; remarks upon lines and leads; table of soundings across the straits of Florida from Sand key to El Moro. 1866.
Sketch 17.

*Supplement to above. Rates of outrun of line. p. 139.

*6. Preliminary report on the interference tides of Hell Gate, with directions for reducing the soundings. By Henry Mitchell. pp. 44–46.

Contents.—Table of relative elevations of tidal planes from observations; tides and currents of Hell Gate from observations of 1857.

*7. Tide tables for the Atlantic and Pacific coasts of the United States for the year 1867. pp. 47–49.

Only a specimen page of the tables printed in this appendix, being the predictions for Eastport, Me.

*8. Report on the geodetic connection of the two primary base-lines in New York and Maryland, their degree of accordance and accuracy of the primary triangulation intervening, with the resulting angles and distances as finally adjusted. Prepared by Charles A. Schott, assistant. pp. 49–54.

*Supplement to above. Length of the Kent island base line. p. 140.

9. Determination of time by means of the transit instrument. Prepared for the Coast survey manual by C. A. Schott, assistant. pp. 55–71.

Description, use, adjustment, and method of observation.
1 fig.

*10. Determination of the astronomical latitude of a station by means of the zenith telescope. (Prepared for the Coast survey manual by C. A. Schott, assistant.) pp. 72–85.

Contents.—(1) General remarks on Talcott's method; (2) modification of instrument; (3) description; (4) adjustment; (5) selection of stars for observation; (6) directions for observing; (7) off the meridian; (8) general expression for the latitude; (9) determination of the value of a division of micrometer; (10) of level; (11) correction for differential refraction; (12) reduction to the meridian; (13) record of the observations; (14) reduction of the observations; (15) discussion of the results; (16) combination of the results by weight.—Examples to articles 9, 10, 13, and 14.
Sketch 28.

*11. Determination of the astronomical azimuth of a direction. (Prepared for the Coast survey manual by C. A. Schott, assistant.) pp. 86–99.

Contents.—(1) Principal methods; (2) astronomical azimuth; (3) geodetic azimuth; (4) primary and secondary azimuths; (5) time; (6) instruments used; (7) azimuth marks; (8) errors eliminated; (9) circumpolar stars used; (10) high stars; (11) sets of observations; (12) method of recording and reducing; (13) observations of a close circumpolar star near its elongation; (14) at any hour angle; (15) computation by fundamental trigonometrical formula; (16) by Napier's analogies; (17) by a development into a series; (18) at equal intervals before and after culmination; (19) observation of sun for azimuth; (20) examples of records and reductions to articles 11, 13, 14, 15, 17, 18, and 19.
Sketches 26 and 27.

*12. Letter of S. C. Walker, esq., to the Superintendent of the coast survey, in relation to the differences of longitude of Philadelphia and Greenwich, by reduction of observations made at Cambridge, Massachusetts. pp. 99, 100.

Reprinted. From Report 1846, app. 10, pp. 71, 72.

*13. Report of S. C. Walker, esq., to the Superintendent of the coast survey, relating to determinations of differences of longitude by telegraph, etc. pp. 100–102.

Reprinted. From Report 1846, app. 11, pp. 72–74.

*14. Annual report to the Superintendent on longitude computations, by S. C. Walker, assistant United States Coast survey. pp. 102–105.

Reprinted. From Report 1848, app. 19, pp. 112–118.

*15. Extract from the report of S. C. Walker, esq., assistant United States Coast survey, to the Superintendent, on the telegraphic operations and the computations in his charge. pp. 106–108.

Reprinted. From Report 1850, app. 15, pp. 85–89.

*16. Report of Sears C. Walker, assistant in the Coast survey, communicating the measures of wave-time made from 1849 to 1851. pp. 109–111.

Reprinted. From Report 1851, app. 25, pp. 476–479.

*17. Abstract of reports on longitudes, by Sears C. Walker, assistant in the Coast survey, to the Superintendent. pp. 111, 112.

Reprinted. From Report 1851, app. 26, pp. 480, 481.

*18. Notes of a discussion of tidal observations, made in connection with the Coast survey, at Cat island, in the Gulf of Mexico, by Professor A. D. Bache, superintendent of the coast survey. pp. 113–119.

Reprinted. From Report 1851, app. 7, pp. 127–136.
1 diag. See sketches H, 2 to 6, inclusive.

*19. Extracts from the report of Professor Agassiz to the Superintendent of the coast survey, on the examination of the Florida reefs, keys, and coast. pp. 120–130.

Reprinted. From Report 1851, app. 10, pp. 145–160.

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*Exhausted.

*20. Report to the Assistant in charge of the Coast survey office on the electrotyping operations of the Coast survey, by George Mathiot, electrotypist. pp. 130–138.
Reprinted. From Report 1851, app. 55, pp. 541–553.

* Supplement to appendix no. 5. Soundings across the Strait of Florida. p. 139.
Berryman apparatus; rates of outrun of line. See 1857, specimen sounding.
Sketch 71.

* Supplement to appendix no. 8. [Length of the Kent island base line.] p. 140.

## 1867

Report of the Superintendent of the United States coast survey, showing the progress of the Survey during the year 1867. Washington: Government printing office. 1869. xii, 334 pp. 4 fig., 2 pl., 23 maps and sketches, 3 diag. 30$^{cm}$.
Benjamin Peirce, superintendent. Report dated at "Cambridge, Mass., December 28, 1867."
Also published as House ex. doc. 275, 40th Cong., 2d sess. In v. 18.

APPENDICES.

*1–4. [Field and office details.] pp. 47–54.

*5. The pantograph—its use in engraving. By E. Hergesheimer. pp. 55, 56.
Sketch 27.

*6. On the longitude between America and Europe from signals through the Atlantic cable. By B. A. Gould. pp. 57–133.
CONTENTS.—(1) Origin of the Coast survey expeditions in 1865 and 1866; (2) previous determinations of trans-Atlantic longitudes from eclipses and occultations; from moon culminations; from chronometers transported from Boston to Liverpool; (3) history of the expedition of 1866; programme of trans-Atlantic longitude campaign; (4) observations at Valencia; table of equatorial intervals; table of observations, October 25 to November 16, 1866; (5) observations at Newfoundland, October 25 to December 16, 1866; (6) observations at Calais, December 11 to 18, 1866; (7) longitude signals between Foilhommerum and Hearts Content; clock corrections, trans-Atlantic longitude and transmission time, October 25 to November 9, 1866; (8) longitude signals between Hearts Content and Calais; tables of Newfoundland and Calais signals; tables of longitude and times of transmission; (9) personal error in noting signals; (10) personal equation determining time; (11) final results for longitude; (12) velocity of transmission; cables of 1865 and 1866; tables of comparison.
Published also by the Smithsonian institution, Washington, 1869. Smithsonian contributions to knowledge, vol. 16, no. 223.

*7. Report upon the comparison of an iron meter forwarded to France by the Government of the United States of America. (Translation.) By F. A. P. Barnard and H. Tresca. pp. 134–137.
CONTENTS.—Table I, the United States meter upon the comparator; II, the Conservatoire standard upon the comparator; III, the United States meter upon the comparator; IV, results.

*8. New meridian instrument for time, latitude, and azimuth, by George Davidson, assistant United States Coast survey. pp. 138, 139.
Sketch 28.
Reprinted, Rept., 1879, app. 7, pp. 103–109.

9. On the use of railways for geodetic surveys by J. E. Hilgard, assistant in the Coast survey. pp. 140–144.
CONTENTS.—Wheel records; linear measurement; rectification of curves; reduction of the measured lines and angles to a simpler system.
Sketch 26.

*10. Description of a reflector used as a signal in triangulation, designed by J. E. Hilgard, assistant United States Coast survey. p. 145.
1 diag.

*11. Report on the field and office work relating to the tides. By R. S. Avery. pp. 146–148.

*12. Report of Assistant Henry L. Whiting, on the special survey of Provincetown harbor, Massachusetts. pp. 149–157.

*13. Report to the Superintendent of the coast survey on the tides and currents of Hell Gate, by Henry Mitchell, chief of physical hydrography, United States Coast survey. pp. 158–169.
CONTENTS.—General scheme of tides and currents: (1) General scheme of tidal interference; observations and results; curves. (2) Tides from stations selected as characteristic for New York harbor and its approaches. (3) Intervals and heights of tides from simultaneous observations. (4) Restoration of level between gauges at Hell Gate ferry and Pot Cove, 1857; diagram. (5) Currents of New York harbor; general scheme of currents, graphic.
4 figs.

*14. Report upon surveys in the Merrimack river, made in 1867 by Henry Mitchell, assistant U. S. Coast survey. pp. 170–175.
Respecting its navigation, with tables.
1 map. Sketch 2.

*15. Report of Assistant Henry Mitchell on soundings made to develop the character of the Strait of Florida between Key West and Havana. pp. 176–179.
CONTENTS.—Table I, soundings in the Gulf stream near the coast of Cuba, 1867; II, current observations.
Sketch 25.
Supplement, 1868, pp. 166–167.

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*Exhausted.

*16. Report on the fauna of the Gulf stream in the strait of Florida. By Assistant L. F. Pourtales. pp 180–182.

Dredgings in the strait of Florida.

*17. Letters of Professor Agassiz on the relation of geological and zoological researches to general interests, in the development of coast features. pp. 183–186.

*18. Report of Assistant George Davidson relative to the resources and the coast features of Alaska territory. pp. 187–329.

CONTENTS.—Directory of the coast, 226–264; list of geographic positions, 265–274; aids to navigation, 274–280.
Sketches 21 to 23.
Errata, p. 280, 22 from bottom, *read* Escholtz bay.
This is the basis of the Coast pilot of Alaska, published in 1869. First submitted for publication Nov. 30, 1867.

*19–20. [Obituary, etc.] pp. 330–334.

## 1868

Report of the Superintendent of the United States coast survey, showing the progress of the Survey during the year 1868. Washington: Government printing office. 1871.

xiii, 277 pp. 14 fig., 28 maps and sketches, 1 diag. $30^{cm}$.

Benjamin Peirce, superintendent.
This and succeeding reports are dated at the Survey office, Washington.
Also published as House ex. doc. 71, 40th Cong., 3d sess. In v. 11.

### APPENDICES.

*1–4. [Field and office details.] pp. 43–50.

5. Discussion of tides in Boston harbor, by William Ferrel, M. N. A. S. pp. 51–102.

CONTENTS.—The observations and the locality; expression of the disturbing forces; tidal expressions; object and plan of discussion.—Tables I, II, III, and IV, of average normal values; V, the constant or mean tide; the semimonthly inequality; VI, inequality depending upon the moon's mean anomaly; VII, inequality depending upon the moon's longitude; VII, *bis* inequality depending upon the sun's anomaly and longitude; VIII, inequality depending upon the moon's node; IX, inequalities depending upon $\eta_8$ and $\eta_9$; diurnal tide; recapitulation of results; comparisons with the equilibrium theory; determination of the general constants; comparisons with the dynamic theory; prediction formulas and tables I–XI; computation of a tidal ephemeris; conclusion; example of the computation of a tidal ephemeris.
1 fig.

*6. Mode of forming a brief tide-table for a chart, by R. S. Avery. pp. 103–108.

Sketch 29.

*7. Memoranda relating to the field-work of the secondary triangulation. Prepared by Richard D. Cutts, assistant. pp. 109–139.

CONTENTS.—Selection of stations; names of stations; signals; tripods and scaffolds; underground station marks; surface station marks; observations and records; number of observations; limit of error; probable error; reduction to center; correction for phase; correction for eccentricity; spherical excess; distribution of error; trigonometrical leveling; coefficient of refraction; three-point problem; rectangular coordinates; measurements of subsidiary base lines; records and computations.
1 fig.
See edition 2, with additions, printed as a separate publication (1877), and edition 3 in Rept. 1882, app. 9.

*8. Method of adjustment of the secondary triangulation of Long Island sound. Communicated by Charles A. Schott, assistant Coast survey. pp. 140–146.

Example of reduction of angular measure of Shelter island; final computation and proof of correctness.
1 map.

*9. Results of the measure of an arc of the meridian of 3° 23′, between Nantucket and Farmington, Maine. Reported by Charles A. Schott, assistant Coast survey. pp. 147–153.

CONTENTS.—Length of the arc by four methods; accuracy of the preceding results; table and diagram determination of the astronomical latitudes; recapitulation of results.
1 fig., 1 map.

10. Addenda to appendixes No. 9 and No. 11 of the Coast survey report of 1866. Prepared by Charles A. Schott, assistant in charge of computing division. pp. 154–165.

CONTENTS.—Supplement, 1868, p. 157.—Specimen table of local times of elongations and culminations of four circumpolar stars for 1873, latitude 40°, longitude 6h. west of Greenwich; correction for altered dates and latitudes. Supplement, p. 158.—In vertical of star; example of record and reduction; micrometer values; deduction of azimuth. Supplement, p. 160.—(*a*) Near culmination; example of record and computation; eyepiece micrometer, values determined and applied to level correction; (*b*) pivot micrometer, ditto, with example and record of reduction; single micrometer turn, ditto; discussion of set of four stars; centering of instrument for connection with triangulation.

*11. Note on Gulf stream observations. Communicated to Professor Benjamin Peirce, superintendent United States Coast survey, by Assistant Henry Mitchell, in charge of physical hydrography. pp. 166–167.

Decrease of bottom temperature in still-water channels. (Sequel to 1867, p. 179.)

*12. Report of Assistant L. F. Pourtales on dredgings made in the sea near the Florida reefs. pp. 168–170.

Organic specimens, corals, echinoderms, brachiopods, etc.

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*Exhausted.

*13. List of geographical positions determined by the United States Coast survey, continued from the annual reports of 1851, 1853, 1855, 1857, 1859, 1864, and 1865. pp. 171–242.

*14. Geographical names on the coast of Maine. By Rev. Edward Ballard, secretary of the Maine historical society. pp. 243–259.
1 fig.

*15. Condensed account of M. Hellert's explorations on the isthmus of Panama, including his special explorations on the Isthmus of Darien; with suggestions for conducting a future survey. By George Davidson, assistant United States Coast survey. pp. 260–277.

CONTENTS.—Explorations; plan for exploration of the river Darien; outfit and duties of engineers' instrumental outfit; use of the heliotrope for communicating messages; form of record of levelings, courses, and distances; rod for leveling, distance, and station mark for courses; to pack, unpack, and refill steel barometer; methods of ascertaining the discharge of water in any stream.
4 fig.

## 1869

Report of the Superintendent of the United States coast survey, showing the progress of the Survey during the year 1869. Washington: Government printing office. 1872.

xxi, 259 pp. 17 fig., 23 maps and sketches, 3 diag. 30cm.
Benjamin Peirce, superintendent.
Also published as House ex. doc. 206, 41st Cong., 2d sess. In v. 8.

APPENDICES.

*1–4. [Field and office details.] pp. 65–74.

5. On the reclamation of tide-lands and its relation to navigation. By Henry Mitchell, chief in physical hydrography, United States Coast survey. pp. 75–104.

CONTENTS.—(1) General discussion; scour of tidal and river currents; general rule of bar scouring; parallel works; traverse works; physical history of salt marshes; shingle levees; other natural levees; Peirce's criterion; (2) field work; Green Harbor river; North river; tabular sections of shingle levees; sand beach; section of slueway formed by Minot's gale; general rise; local changes of heights of tide; tables; effect of a dam; general conclusions relative to the projects of reclamation; shore of Nahant; tabular sections; maps and diagrams (in text).
1 map, 1 diag.

*6. Report on the connection of the primary base lines on Kent island, Maryland, and on Craney island, Virginia, and on the degree of accuracy of the intervening primary and sub-primary triangulations. Prepared in May, 1871, by Charles A. Schott, assistant Coast survey. pp. 105–112.

CONTENTS.—Statistics of conditions; linear discrepancies in the base lines; degree of accuracy; final correction of directions; adjustment of the subprimary stations; Cape Charles light and north end of measurement; adjustment of the secondary station, Hampton seminary; table of Atlantic series of primary triangles continued.

*7. Local deflections of the zenith in the vicinity of Washington city, reported February 9, 1870, by Charles A. Schott, assistant Coast survey. pp. 113–115.
1 fig.

8. Reports of observations of the eclipse of the sun on August 7, 1869, made by parties of the United States Coast survey, at the following principal stations: Bristol, Tennessee, in charge of Assistant R. D. Cutts; Shelbyville, Kentucky, in charge of Professor J. Winlock and Assistant G. W. Dean; Springfield, Illinois, in charge of Assistant C. A. Schott, under the immediate direction of the Superintendent of the survey; Des Moines, Iowa, in charge of Assistant J. E. Hilgard; and Kohklux, Chilkaht river, Alaska, in charge of Assistant G. Davidson. pp. 116–198.

Illustrated by woodcuts and plates nos. 24, 25, and 26. 16 figs., 1 map, 2 diag.
Errata, p. 165.

9. Report on the results from the observations made at the magnetical observatory, on Capitol hill, Washington, D. C., between 1867 and 1869, by Charles A. Schott, assistant. pp. 199–207.

CONTENTS.—Magnetic instruments; scheme of observing; instrumental constants; results; declination on Capitol hill; turning epochs; dip; horizontal force; tabular synopsis of magnetic elements observed in the District of Columbia.

*10. Report upon deep-sea dredgings in the Gulf stream during the third cruise of the United States steamer Bibb, addressed to Professor Benjamin Peirce, superintendent United States Coast survey, by Louis Agassiz. pp. 208–219.

CONTENTS.—Fauna of the submarine zones; reef zone; sedimentary zone; coral slope of living cretacean types; floor of foraminiferine mud; geological inferences; inclination of the reefs; pot holes; formation of oölithic, amorphous, and compact limestones; the Jurassic submarine seam; embryology of corals and formation of colonies by disk embranchment; extinct forms representing modern developmental transitions; lines to be dredged.

*11. The Gulf stream.—Characteristics of the Atlantic sea-bottom off the coast of the United States, by L. F. Pourtales, assistant United States Coast survey. pp. 220–225.

Manner of dredging; silicious formation; greensand formation.

12. On the use of the zenith-telescope for observations of time, by J. E. Hilgard. pp. 226–232.

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* Exhausted.

13. Abstract of a paper read before the National academy of sciences, April 16, 1869, on the earthquake-wave of August 14, 1868. By J. E. Hilgard, assistant Coast survey, in charge of office. pp. 233-234.
    With wave table.

14. Solution of the "three-point problem" by determining the point of intersection of a side of the given triangle with a line from the opposite point to the unknown point. By A. Lindenkohl, chief draughtsman, Coast survey office. p. 235.
    1 diag.

*15. Reports concerning Martha's Vineyard and Nantucket, by Assistants H. L. Whiting and Henry Mitchell. pp. 236-259.
    CONTENTS.—(A) Edgartown harbor, changes; Vineyard Haven, its character as a port of refuge and its present condition; Table I, exposure of anchorages in Provincetown harbor; II, in Vineyard Haven; III, in Great Woods Hole; IV, in Tarpaulin cove; V, in Edgartown roadstead; VI, in Old Stage harbor; VII, in New Bedford harbor and Quicks Hole; VIII, in Plymouth harbor; IX, in Boston harbor and Nantasket roads; X, in Boston harbor and Hull bay; XI, in Boston harbor and Presidents roads and Georges roads; XII, in Marblehead harbor; XIII, at Salem harbor; XIV, at Gloucester harbor; XV, in lower bay, New York harbor; XVI, in upper bay, New York harbor; XVII, anchorage room and average exposure in the respective harbors. (B) Surveys of summer, 1871: (1) Physical aspect and peculiarities; (2) Edgartown tides, difference of heights; (3) Nantucket tide tables; (4) elements of the field work.
    1 diag.

## 1870

### Report of the Superintendent of the United States coast survey, showing the progress of the Survey during the year 1870.* Washington: Government printing office. 1873.

1 pl.

xiii, 232 pp. 8 fig., 25 maps and sketches, 2 diag. 30$^{\text{cm}}$.

Benjamin Peirce, superintendent.
Also published as House ex. doc. 112, 41st Cong., 3d sess. In v. 11.

APPENDICES.

*1-4. [Field and office details.] pp. 53-65.

*5. A tabular statement of results computed for tide-tables for charts of the western coast of the United States. By R. S. Avery. pp. 66-69.

*6. Mode of forming brief prediction tide-tables. By R. S. Avery. pp. 70-74.

*7. Report on the leveling operations between Keyport, on Raritan bay, and Gloucester, on the Delaware river, to determine the height above mean tide of the primary stations Beacon hill, Disborough, Stony hill, Mount Holly, and Pine hill. By Richard D. Cutts, assistant Coast survey, in charge of secondary triangulation. pp. 75-76.
    CONTENTS.—Heights above mean tide determined by the spirit level, p. 75; tidal stations, p. 75; instruments, p. 75; tidal observations and records, p. 76.

*8. Report on results of the barometrical observations made, in connection with the line of spirit-leveling from Raritan bay to the Delaware river, to determine the heights above mean tide of the primary stations Mount Holly, Stony hill, Pine hill, Mount Rose, Newtown, Willow grove, Gard, Bethel, and Lippincott. By Richard D. Cutts, assistant Coast survey, in charge of secondary triangulation. pp. 77-89.
    CONTENTS.—Comparison of instruments and the determination of personal errors, pp. 77-81; the computations, pp. 81-89.

*9. Heights above the half tide level of the ocean of trigonometrical stations, determined by the United States Coast survey. pp. 90-91.

*10. Descriptions of bench-marks at tidal stations. pp. 92-97.

*11. Extract from a report to Professor Benjamin Peirce, superintendent United States Coast survey, relative to a method of determining elevations along the course of a tidal river, without the aid of a leveling instrument, by Assistant Henry Mitchell. pp. 98, 99.
    CONTENTS.—By setting up graduated staves at such distances apart that the stacks of the tidal currents extend from one to another. Rule: The difference in the elevations of the zeros of the gauges is equal to one-half the sum of the differences of their readings at the two slack waters.

*12. Results of the telegraphic determination of the longitude of San Francisco, California. p. 100.

*13. Abstract of results for difference of longitudes between the Harvard college observatory, Cambridge, Massachusetts, the Coast survey station, Seaton, on Capitol hill, and the United States Naval observatory, Washington, D. C., as determined by means of the electric telegraph, in 1867, by the United States Coast survey, with the cooperation of Professor Joseph Winlock, director of the Harvard observatory, and Commodore B. F. Sands, U. S. N., superintendent Naval observatory. pp. 101-106.

*14. New investigation of the secular changes in the declination, the dip, and the intensity of the magnetic force, at Washington, D. C. (Report to the Assistant in charge of the office, by Charles A. Schott, assistant.) pp. 107-110.

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*Exhausted.

*15. Results of observations for daily variation of the magnetic declination, made at Fort Steilacoom, Washington territory, in 1866, and at Camp Date Creek, Arizona, in 1867, by David Walker, M. D., acting assistant surgeon, United States Army. (Discussed and reported to the Assistant in charge of the Coast survey office, by Charles A. Schott, assistant Coast survey.) pp. 111–114.
1 diag.

*16. Reports of observations upon the total solar eclipse of December 22, 1870. pp. 115–177.
CONTENTS.—Extent of the corona as indicated by the spectroscope, p. 150; nature of the coronal envelope and its relation to the sun, p. 152; constitution of the solar atmosphere, p. 153; suggestions with reference to the observation of future eclipses, pp. 154–158.
8 fig., 1 pl., 1 diag.

*16a. Report on the eclipse of the sun on the 22nd of December, 1870. By Benjamin Peirce, LL. D., superintendent United States Coast survey. pp. 229–232.
Reprinted from Report for 1871, pp. 9–14.

*17. Changes of elevation and azimuth caused by the action of the sun, at Station Dominguez, California, by Assistant George Davidson. pp. 178, 179.

*18. On the probable effect of extended piers in modifying the channel facilities of San Francisco bay, near Yerba Buena island, by Assistant Henry Mitchell. pp. 180, 181.

*19. On the phosphate beds of South Carolina, by Professor N. S. Shaler. pp. 182–189.

*20. On the moon's mass as deduced from a discussion of the tides of Boston harbor, by William Ferrel, esq. pp. 190–199.

*21. On the theory of errors of observations, by Assistant C. S. Peirce. pp. 200–224.
1 diag.

*22. Azimuth and apparent altitude of Polaris, by Assistant George Davidson. pp. 225–227.

## 1871

Report of the Superintendent of the United States coast survey, showing the progress of the Survey during the year 1871. Washington: Government printing office. 1874.

xv, 219 pp. 11 fig., 30 maps and sketches, 5 diag. 30cm.
Benjamin Peirce, superintendent.
Also published as House ex. doc. 121, 42d Cong., 2d sess. In v. 11.

APPENDICES.

*1–5. [Field and office details.] pp 71–92.

*6. Report of meteorological effects on tides, from observations by Prof. Wm. Ferrel. pp. 93–99.
Graphic representation of the relative amounts and direction of the wind for each of the four seasons for Boston.
1 fig.

*7. Meteorological register, Alaska territory, 1870–71, from observations at St. Paul's island, by Charles Bryant. pp. 100–108.

*8. The harbor of New York: its condition, May, 1873. Letter of Prof. Benjamin Peirce, superintendent United States Coast survey, to the Chamber of commerce of New York, with the report of Prof. Henry Mitchell on the physical survey of the harbor. pp. 109–133.
CONTENTS.—Increase of Jersey flats; diagram A; changes in Buttermilk channel; changes in the vicinity of Middle Ground shoal and Gowanus bay; changes at and near the Sandy Hook entrance; tides and currents; phenomena in the pathway of the Hudson; movement through East river; East river and Hudson tidal current compared; relations of East river movements to those over the bar; Tables 1 to 17; diagrams B, C, D.
Sketches 30, 31, 32.

*9. Report to Prof. Benjamin Peirce, superintendent United States Coast survey, concerning Nausett beach and the Peninsula of Monomoy, by Assistant Henry Mitchell. pp. 134–143.
Physical history of the neighborhood of Monomoy (sketch 35); recent movement of Chatham beach in detail; tables.

*10. Hints and suggestions upon the location of harbor-lines, by Henry Mitchell, United States Coast survey. pp. 144–153.
CONTENTS.—Value of tidal volume; encroachment on the channels; isodynamic lines (sketch 35); example; anchorage and winding room; requisite depths of frontage; length of slips; riparian rights; laws establishing harbor lines.
1 diag.

*11. Comparison of the methods of determining heights by means of leveling, vertical angles, and barometric measures, from observations at Bodega head and Ross mountain, Cal., by George Davidson and Charles A. Schott, assistants, United States Coast survey. pp. 154–170.
CONTENTS.—(1) result of the leveling operations. (2) results of hourly observations of reciprocal and simultaneous zenith distances for difference of height of the two stations; Tables 1 to 6, zenith distances, atmospheric pressure, etc., reduction of zenith distances; diagrams. (3) results of hourly observations of atmospheric pressure for difference of height of the stations; diagrams.
Reprinted. Rept. 1876, app. 16, pp. 338–354.
5 fig.

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* Exhausted.

*12. Report on the leveling operations between Keyport, on Raritan bay, and Gloucester, on the Delaware river, to determine the height above mean tide of the primary stations, Beacon hill, Disborough, Stony hill, Mount Holly, and Pine hill, by Richard D. Cutts, assistant, Coast survey, in charge of secondary triangulation. pp. 171–175.

Tidal stations; instruments; field operations and records; Tables I to V.

*13. Report of observations of the total solar eclipse of December 22, 1870, by George W. Dean, assistant United States Coast survey. pp. 176–179.

Abstract of the chronographic record.

*14. Report of observation of the eclipse of the sun of December 22, 1870, by Dr. C. H. F. Peters, director of the Litchfield observatory of Hamilton college. pp. 180–184.

*15. On the adaptation of triangulations to the various conditions of configuration and character of the surface of country and other causes. Report to Prof. Benjamin Peirce, superintendent, February 20, 1873, by Charles A. Schott, assistant United States Coast survey. pp. 185–188.

Reprinted. Rept. 1876, app. 20, pp. 391–399.
2 fig.

*16. Description of a new form of mercurial horizon, in which vibrations are speedily extinguished, by J. Homer Lane, of Washington, D. C. pp. 189–192.

2 fig.
Directions for setting up and using.

*17. General index of professional and scientific papers contained in the United States Coast survey reports from 1851 to 1870. pp. 193–209.

*18. Errata from 1851 to 1870. pp. 210–219.

## 1872

Report of the Superintendent of the United States coast survey, showing the progress of the Survey during the year 1872. Washington: Government printing office. 1875.

xii, 267 pp. 7 fig., 3 pl., 21 maps and sketches, 4 diag. 30^cm^.

Benjamin Peirce, superintendent.
Also published as House ex. doc. 240, 42d Cong., 3d sess. In v. 12.

### APPENDICES.

*1–5. [Field and office details.] pp. 55–68.

*6. Field and office work relating to the tides, by R. S. Avery. pp. 69–72.

*7. Maxima and minima of tides on the coast of New England for 1873, by William Ferrel. pp. 73–74.

*8. Report of the astronomical and meteorological observations made at Sherman, Wyoming territory, by Richard D. Cutts, assistant United States Coast survey, and Charles A. Young, professor of astronomy in Dartmouth college, New Hampshire, under the act of Congress of June 10, 1872. pp. 75–172.

CONTENTS.—Part I, report of R. D. Cutts (sketch 18 A).—Latitude and longitude of Sherman; terrestrial magnetism; meteorology; Table I, difference of reading of observers; Table II, daily means; diagram 1; Table III, hourly means; diagram 2; Table IV, hourly means; aneroid barometer; solar radiation; Table V, amount of solar radiation; Table VI, solar radiation; altitude of the sun; atmospheric electricity; diagram; Table VIII, altitude of the astronomical station; spirit level; barometer; Tables IX, X, XI; boiling-point apparatus; Table XII, temperature of boiling water at Sherman; Table XIII, height of Long's peak, etc.; Sherman, its atmosphere and climate; meteorological journal. Part II, report of Prof. C. A. Young.—Spectrum of the chromosphere; catalogue of bright lines in the spectrum of the chromosphere, 1872; table showing the number of coincidences between the bright lines observed in the spectrum of the chromosphere and those in the spectrum of the chemical elements; spectra of sun spots; catalogue of lines affected in the spot-spectrum between B and *b*; solar eruptions and other disturbances.
6 fig., 1 pl., 1 map, 2 diag.

*9. Astronomical observations on the Sierra Nevada, by George Davidson, esq., assistant in the United States Coast survey. pp. 173–176.

Description of the country adjacent to the station at Summit; the climate and opportunities for observing; the observations; Polaris, Saturn, Moon, etc.

*10. Harbors of Alaska and the tides and currents in their vicinity, by W. H. Dall, acting assistant in the United States Coast survey. pp. 177–212.

CONTENTS.—Statistics; notes on the North Pacific current; hydrographic notes on Captains bay and vicinity; meteorology of Unalashka; tides of Iliuliuk; compound tides; semidiurnal tides; tide referred to the lower transits; to the upper transits; semidiurnal tides; tidal current of Unalashka; the Alaska current; its effect on the climate of the Aleutian district; the circular current of Bering sea; the Shumagin islands; western; eastern; miscellaneous hydrographic notes; meteorological observations from September, 1871, to October, 1872; current observations; tides of Iliuliuk.
Sketch 18.

*11. Voyage of the steamer Hassler from Boston to San Francisco, by L. F. Pourtales, esq., assistant in the United States Coast survey. pp. 213–221.

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* Exhausted.

12. Determination of weights to be given to observations for determining time with portable transit-instruments, recorded by the chronographic method. Report to the Assistant in charge of the Coast survey office, by Charles A. Schott, assistant. pp. 222–226.

CONTENTS.—Relative weights to transits depending on the star's declination; relative weights to incomplete transit observations; reduction of observations for time.

*13. Preliminary report on the determination of transatlantic longitudes, by J. E. Hilgard, assistant. . pp. 227–234.

CONTENTS.—Brest, Greenwich, Paris; results of observation for personal equation; longitudes; Brest-Greenwich, Brest-Paris, Greenwich-Paris; Brest-St. Pierre-Cambridge; Harvard observatory-Greenwich; Washington-Greenwich; Washington-Paris.

*14. Terrestrial magnetism. Notes on magnetical observations by means of portable instruments, prepared for the use of observers by C. A. Schott, assistant in the United States Coast survey. pp. 235–254.

CONTENTS.—(1) Determination of the magnetic declination; adjustment of the declinometer; example of scale reading; magnetic declination; example; (2) absolute and relative measures of the magnetic force; the magnetometer; observations of deflections; horizontal intensity; deflections; form 1; magnetometer with attached theodolite; deflecting magnet in the magnetic prime vertical; form 2; theodolite magnetometer; deflecting and deflected magnets at right angles to each other; observations of oscillations; example; calculation; example of observation of deflections; (3) determination of the magnetic declination; reversal of poles of dipping needles; magnetic dip; specimen of record for finding magnetic meridian; magnetic dip; computation; concluding remarks. Appendix.—Ordinary adjustments of the theodolite.

*15. Correspondence relative to the preservation of New York harbor. pp. 255–256.

*16. The Middle-Ground shoal, New York harbor. By Henry Mitchell. pp. 257–261.

Tables of current observations.
Sketch 22.

*17. Report on shore-line changes at Edgartown harbor, Massachusetts, by H. L. Whiting, esq., assistant in the United States Coast survey. pp. 262–265.

Sketch 23.

*18. Improvement on the Hipp chronograph, by William Eimbeck. pp. 266, 267.

1 fig.

# 1873

Report of the Superintendent of the United States coast survey, showing the progress of the Survey during the year 1873. Washington: Government printing office. 1875.

xii, 180 pp. 2 fig., 18 maps and sketches, 3 diag. $30^{cm}$.

Benjamin Peirce, superintendent.
Also published as House ex. doc. 133, 43d Cong., 1st sess. In v. 11.

APPENDICES.

*1–5. [Field and office details.] pp. 67–81.

*6. List of original topographical sheets registered in the archives of the United States Coast survey from June, 1865, to January, 1873. pp. 82–87.

*7. List of hydrographic sheets registered in the archives of the United States Coast survey from June, 1865, to January, 1873. pp. 88–93.

*8. Report on the physical survey of Portland harbor. By Henry Mitchell. pp. 94–102.

1 diag.

*9. Additional report concerning the changes in the neighborhood of Chatham and Monomoy. By Henry Mitchell. pp. 103–107.

1 diag.

*10. Note concerning changes in the submerged contours off Sandy Hook. By Henry Mitchell. pp. 108–110.

1 fig. Tables.

*11. Report of geographical and hydrographical explorations on the coast of Alaska, by W. H. Dall, assistant in the Coast survey. pp. 111–122.

CONTENTS.—Islands of Attu, Bouldyr, Kyska, Amchitka, Adakh, Atka, Amlia, Four Craters, Agashagok, Unalashka, Sannakh reefs, Popoff strait, current observations, azimuths, positions, and magnetic declinations, Tables 1 to 16; thermometer, mean for 1873; surface of sea water; five fathoms below surface; current observations made on board the *Yukon* during the voyage from San Francisco to Unalaska, May, 1873; heights of mountains determined in 1873.
Sketch 17.

*12. Measurement of a primary base-line on Peach-Tree ridge, near Atlanta, Georgia, in 1872 and 1873, by C. O. Boutelle, assistant. Computed and reported by Charles A. Schott, assistant. pp. 123–131.

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*Exhausted.

*12a. Description of the compensation base-apparatus of the U. S. Coast survey. By Lieut. E. B. Hunt, U. S. A.

CONTENTS.—Condition of the apparatus; comparison of the tubes; synopsis of results; table of horizontal distances measured between temporary marks near the monuments in each of the three measures; corrected distances; discrepancies in the three measures; heights above mean half tide; probable error of computed length; comparison with the accuracy of other base lines.

1 diag.

Reprinted from Rep. of 1854, pp. 132–136.

*13. Note on intervisibility of stations. By J. E. Hilgard. p. 137

1 fig.

14. A list of stars for observations of latitude. pp. 138–174.

15. Errata in the Heis catalogue of stars. pp. 175–180.

## 1874

Report of the Superintendent of the United States coast survey, showing the progress of the Survey during the year 1874. Washington: Government printing office. 1877.

xiv, 242 pp. 13 fig., 1 pl., 23 maps and sketches, 1 diag. 30cm.

C. P. Patterson, superintendent.

Also published as House ex. doc. 100, 43d Cong., 2d sess. In v. 14.

### APPENDICES.

*1–5. [Field and office details.] pp. 49–61.

6. Geographical positions of prominent places in the United States determined astronomically or geodetically by the United States Coast survey. pp. 62–65.

7. Table of depths, showing the least water in the channels of certain harbors, rivers, and anchorages on the coasts of the United States. pp. 66–71.

*8. On the secular change of magnetic declination in the United States and other parts of North America: New discussion by Charles A. Schott, assistant Coast survey. pp. 72–108.

This is ed. 2 of the following series of editions: ed. 1, Rept. 1855, app. 48, Rept. 1856, app. 31, and Rept. 1859, app. 24; ed. 3, Separate pub. (1879); ed. 4, Rept. 1879, app. 9; ed. 5, Rept. 1882, app. 12; ed. 6, Rept. 1886, app, 12; ed. 7, Rept. 1888, app. 7; ed. 8, Rept. 1895, app. 1.

*9. Results of observations of terrestrial magnetism at Key West, Fla., made between 1860 and 1866, under the direction of Prof. W. P. Trowbridge and Mr. S. Walker; discussed and reported by Charles A. Schott, assistant United States Coast survey. pp. 109–130.

3 fig.

*10. Transit of Venus, 1769. Results of observations for determining positions occupied in Lower California and at Philadelphia, reported by Charles A. Schott, assistant, in charge of the computing division, Coast survey office. pp. 131–133.

1 map (sketch 22).

*11. Additional geographical positions determined astronomically by the Coast survey on and near the western coast. p. 134.

12. Report on an inspection of the terminal points of the proposed canals through Nicaragua and the Isthmus of Darien, by Professor H. Mitchell, United States Coast survey. pp. 135–147.

CONTENTS.—Greytown; history of the harbor; causes of its decline and final destruction; the work of restoration; obstructions of the Lower San Juan; recapitulation; result of foregoing discussion; Urabá mouth of the Atrato; conclusions relative to the improvement of the Urabá; Brito; conclusions; Limon and Chiri Chiri bays; general exposure.

*13. Economy in coal, as exemplified by the action of compound engines in the United States Coast survey steamer Hassler, reported by Charles E. Emery, consulting engineer. pp. 148–151.

General description of the "Hassler."

*14. Device for detaching from a line the heavy weight requisite in deep-sea soundings, by Lieut. Commander C. D. Sigsbee, U. S. N., assistant Coast survey. p. 152.

1 pl. (sketch 23).

*15. Improved clamp for the telescope of the theodolite. By George Davidson. p. 153.

1 fig.

*16. Description of an ocean salinometer, by J. E. Hilgard, assistant United States Coast survey. pp. 154, 155.

1 fig.

*17. Description of two forms of portable apparatus for the determination of personal equation, both relative and absolute, in observations of star transits, by J. E. Hilgard, assistant United States Coast survey. pp. 156–162.

1 fig., 1 diag.

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* Exhausted.

18. Transatlantic longitudes. Final report on the determination of 1872, with a review of previous determinations. By J. E. Hilgard, assistant. pp. 163-242.

CONTENTS.—Part I—Section I, Cambridge; II, St. Pierre; III, Brest; IV, Paris-Greenwich; V, Cambridge-St. Pierre; VI, St. Pierre-Brest; programme for cable exchanges; VII, personal error in noting cable time signals; VIII, wave time of cable signals; IX, Brest-Paris and Brest-Greenwich; X, personal equation Blake-Folain; XI, personal equation, Blake-Greenwich standard observer, and longitude Greenwich-Paris; XII, personal equation of Coast survey observers; XIII, flexure of transit axis; XIV, final discussion of the results for longitude differences, Brest, Greenwich, Paris; XV, final combination of the longitude differences deduced from the observations of 1872, 1870, and 1866; finally adopted longitudes from observations of 1866, 1870, and 1872. Part II—Reduction of the observations made for the trans-Atlantic longitude determination of 1872; clock and instrumental corrections at Cambridge, Mass., at St. Pierre, Miquelon, Brest, Paris, and Greenwich; observations with the Gambey meridian transit; azimuths of the meridian mark; observations on $\alpha$, $\delta$, and $\lambda$ Ursæ Minoris; coefficients employed; difference of longitude Paris-Brest; observations with the Gambey meridian transit and the Morse-Digney chronograph for difference of personal equation; difference of longitude, Paris-Greenwich; results of telegraphic time signals exchanged between Cambridge and St. Pierre; between St. Pierre and Brest; between Brest and Paris; between Brest and Greenwich; between Greenwich (Coast survey transit) and Paris; personal error in noting cable time signals at St. Pierre; at Brest; differences of personal equations.
7 fig.
Errata, pp. 163, 164, 167, 168, 169, 172, 173, 177, 178, 180, 207, 237, 242.

Tidal researches, by William Ferrell. Stereotyped by Welsh, Bigelow & Co., Cambridge, Mass. Printed at Government printing office, Washington, D. C., 1874.

XIII, 268 pp., 13 fig.
Not numbered. Not bound with Report.

## 1875

Report of the Superintendent of the United States coast survey, showing the progress of the Survey during the year 1875. Washington: Government printing office. 1878.

xx, 414 pp. 15 fig., 6 pl., 24 maps and sketches, 9 diag. $30^{cm}$.

C. P. Patterson, superintendent.
Also published as House ex. doc. 81, 44th Cong., 1st sess. In v. 11.

APPENDICES.

*1-5. [Field and office details.] pp. 73-86.

*6. Report upon electrotyping and photographing, by Dr. A. Zumbrock. pp. 87, 88.

*7. List of original topographic sheets, geographically arranged, registered in the archives of the United States Coast survey from January, 1834, to July, 1875. (Nos. 1 to 1378, inclusive.) pp. 89-114.

*8. List of hydrographic sheets, geographically arranged, registered in the archives of the United States Coast survey from January, 1835, to July, 1875. (Nos. 1 to 1244, inclusive.) pp. 115-138.

*9. Report on the telegraphic determination of the longitude of Key West, by Charles A. Schott, assistant in the Coast survey. pp. 139-156.

CONTENTS.—Introduction; description of observing stations and of instrumental outfit; relative personal equations; equatorial interval of wires of transit circle; adopted mean places in right ascension of stars observed at Washington and Key West; of clock and chronometer corrections; telegraphic connection and exchange of time signals; telegraphic difference of longitude, Washington-Key West; resulting longitude of Key West and of light-houses in its vicinity.

*10. Report on Mount St. Elias, Mount Fairweather, and some of the adjacent mountains, by William H. Dall, acting assistant in the United States Coast survey. pp. 157-188.

CONTENTS.—I. Historical notes; tabular results of heights, latitudes, and longitudes; general considerations (sketches 22, 23). II. Discussion of data; reduction of observations, made in 1874, to determine the heights of Mounts St. Elias, Cook, Crillon, Fairweather, and Vancouver; details of computations.
1 pl., 1 map.

*11. Report concerning recent observations at South Pass bar, Mississippi river, by Henry Mitchell, assistant in the United States Coast survey. pp. 189-193.

1 diag.

12. Discussion of tides in New York harbor, by William Ferrel. pp. 194-221.

CONTENTS.—General plan and immediate object of the discussion; adopted notations; averages deduced from the observations; Tables I to VI; semidiurnal tides, half-monthly inequality; lunar inequalities; mean sea level; diurnal tide; Table VII; comparison of theory with observation; practcal application; directions for computing a tidal ephemeris. Appendix: Tables I to IV, for computing heights and times of high water; example.

*13. Report on the Transit of Venus expedition to Japan, by George Davidson, assistant in the United States Coast survey. pp. 222-230.

CONTENTS.—Station near Nagasaki, Japan; observers; telegraphic longitude work; details of observations of the transit; photographic work; observations at great elevations.
4 fig.

*14. Report on the Transit of Venus expedition to Chatham island, by Edwin Smith, sub-assistant in the United States Coast survey. pp. 231-248.

CONTENTS.—Station: Foundation; instruments; (sketch no. 25); observations; photography; day of transit; work after the transit; computations and results; latitude observations; mean places of stars observed for latitude; results for latitude; magnetic observations; declination; dip; horizontal intensity; results.
1 map.

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* Exhausted.

*15. Description of an apparatus for recording the mean of the times of a set of observations, by C. S. Peirce, assistant in the United States Coast survey. pp. 249–253.

2 fig., 1 pl.

*16. Terrestrial magnetism. Instructions for magnetical observations. By Charles A. Schott, assistant in the United States Coast survey. pp. 254–278.

CONTENTS.—(1) Magnetic declination; adjustment of the declinometer; example of scale reading; adjustments of the theodolite; solar diurnal variation of declination at Toronto, Canada, Philadelphia, and Key West; (2) magnetic inclination; reversal of the poles of dipping needles; dip circle; magnetic dip; specimen of record for finding magnetic meridian (3) absolute and relative measures of the magnetic force; the magnetometer; deflections; oscillations; deflections for value of $q$ of magnet H.

4 pl.

Reprinted with addition from appendix no. 14. Report of 1872.

*17. Method of closing a circuit of triangulation under certain given conditions, by Charles A. Schott, assistant, and M. H. Doolittle, United States Coast survey. pp. 279–292.

5 fig.

*18. Observations on certain harbor and river improvements collected on a voyage from Hongkong via Suez, to New York, by George Davidson, assistant in the United States Coast survey. pp. 293–314.

CONTENTS.—Nagasaki; Shanghai; Hongkong; Canton; Singapore; Penang; Calcutta; Bombay; Suez and canal; destructive action by passing vessels; current through the canal; saltness of water; tides; breakwater at Port Said; dredging, estimate of cost; Alexandria; Naples; Genoa; Swinemunde; Copenhagen; Kiel; Hamburg; Bremerhafen; Wilhelmshaven; Amsterdam canal; entrance locks and sluices; the béton blocks; North Sea harbor breakwater; dam at Schellingwoude, eastern extremity of the Amsterdam canal; Cherbourg; docks; breakwater; Brest; docks; Admiralty pier, Dover; Portland breakwater; ripraps; Holyhead breakwater; Alderney breakwater; fascinage for breakwater foundations; river improvements.

1 diag.

*19. Formulæ and factors for the computation of geodetic latitudes, longitudes, and azimuths. pp. 315–368.

L, M, Z, forms for primary and secondary triangulation, and inverse solution; tables of factors log A, log B, log C, log D, log E; table of correction to longitude for difference in arc and sine; values of $\log \frac{1}{\cos \frac{1}{2} dL}$; table for referring values of coefficients A, B, C, D, E, from Bessel's to Clarke's ellipsoid; table of log F; auxiliary tables for converting arcs of the Bessel ellipsoid into arcs of the Clarke ellipsoid; formulæ and table for computing the spherical excess of a triangle; table of log *m*.

2 fig.

Errata, pp. 316, 317, 318, 367.

For ed. 1, see Rept. 1860, app. 36.

*20. Meteorological researches for the use of the Coast pilot; preface and part 1, by William Ferrel. pp. 369–412.

CONTENTS.—Prefatory note by C. P. Patterson, superintendent. Part I, on the mechanics and general motion of the atmosphere: Chapter I, general equations of the motions and pressure of the atmosphere. Chapter II, the temperature and pressure of the atmosphere at the earth's surface obtained from observation; Tables I to V; Tables VI to X, of distribution of atmospheric pressure; Chapter III, the general motion of the atmosphere; Table XI, velocities; Table VII, direction and velocities.

2 fig., 7 diag.

Errata, §§ 8, 9, 13, 15, 42.

## 1876

Report of the Superintendent of the United States coast survey, showing the progress of the work for the fiscal year ending with June, 1876. Washington: Government printing office. 1879.

xxii, 418 pp. 28 fig., 25 maps and sketches, 13 diag. 30cm.

C. P. Patterson, superintendent.

Also published as Senate ex. doc. 37, 44th Cong., 2d sess. In v. 4.

### APPENDICES.

*1–5. [Field and office details.] pp. 67–80.

6. A new system of binary arithmetic, by Benjamin Peirce, consulting geometer, United States Coast survey. pp. 81, 82.

7. A catalogue of stars for observations of latitude. J. E. Hilgard. pp. 83–129.

*8. Methods of registering tidal observations, by R. S. Avery. pp. 130–142.

CONTENTS.—Bench marks; tide gauges; self-registering tide gauges; diagrams; how to use three roller gauge; large cylinder gauge; tabulating high and low water; hourly readings; scales of heights; time, precautions.

10 fig.

*9. Changes in the harbor of Plymouth, Mass., by Henry Mitchell. pp. 143–146.

CONTENTS.—Champlain (1605); Blaskowitz (1774); general conclusions and remarks.

Sketch 22.

*10. Report upon the physical survey of New York harbor, 1876. Henry Mitchell, United States Coast survey. pp. 147–185.

Positions of origins and termini of sections examined in 1872–73–74–75; transverse curves of velocity and perimeters.

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* Exhausted.

11. Report concerning the location of a quay or pier line in the vicinity of the United States Navy-yard at New York. Henry Mitchell. pp. 186–189.

    Sketch 23.

12. Review of the characteristics of the South pass, Mississippi river. Henry Mitchell. pp. 190–191.

*13. On marine governors. Charles E. Emery, consulting engineer, United States Coast survey. pp. 192, 196.

*14. Note on the theory of the economy of research, by Assistant C. S. Peirce. pp. 197–201.

    Referring to laws of errors.
    1 fig.

*15. Measurements of gravity at initial stations in America and Europe. C. S. Peirce, assistant. pp. 202–337.

    CONTENTS.—Stations: Geneva, Paris, Berlin, Kew, Hoboken; instruments; duration of an oscillation: correction for rate of timekeeper; correction for arc; arc measures; times of amplitudes; reduction to a vacuum; coefficient of expansion; comparison of meters "A" and "49;" corrections; length of the pendulum; value of the screw revolutions of microscopes; observations of length; comparison of lengths of pendulum standards, concluded length of the pendulum; center of mass; periods of oscillation and values of gravity; length of seconds pendulum at Geneva; tables of experiments.
    1 map, 12 diag. For addendum see pp. 410–416.

16. Comparison of the methods of determining heights by means of leveling, vertical angles and barometric measures, from observations at Bodega head and Ross mountain, Cal., by George Davidson and Charles A. Schott, assistants, United States Coast survey. pp. 338–354.

    2 fig.
    Reprinted from Report of 1871, app. 16.

17. Observations of atmospheric refraction—Contribution No. II. Determination of several heights by the spirit-level, and measures of refraction by zenith-distances, also observations of the barometer at Ragged mountain, Maine, in July, August, and September, 1874, by F. W. Perkins, subassistant. Results deduced and reported by Charles A. Schott, assistant. pp. 355–367.

    CONTENTS.—(A) Results of the operations by spirit level executed near the entrance of Penobscot bay in 1874; (B) results of observations of zenith distances at Ragged mountain for atmospheric refraction; meteorological observations; (C) meteorological observations at Ragged mountain, at Mount Desert, and at White Head light; two short simultaneous sets; resulting differences of height.
    1 fig.

18. On atmospheric refraction and adjustment of hypsometric measures—Contribution No. III. Determination of the coefficient of refraction from zenith-distances observed in northern Georgia, by Assistants C. O. Boutelle and F. P. Webber, in 1873 and 1874, and adjustment of differences of heights by application of the method of least squares. Discussion and report by Charles A. Schott, assistant. pp. 368–387.

    CONTENTS.—(1) Zenith distances; coefficient of refraction from observed zenith distances; resulting values for coefficient of refraction; (2) heights of stations from measured difference of height, with application of the method of least squares; heights above mean sea level; equations; probable error of resulting heights; table of log. M and log. N; table of logarithms of radius of curvature to the earth's surface for various latitudes and azimuths, based upon Clarke's ellipsoid of rotation (1866) and for the metric unit.
    2 fig.

19. Hypsometric formula based upon thermodynamic principles, by Chas. A. Schott. pp. 388–390.

20. On the adaptation of triangulations to various conditions, depending on the configuration or orographic character of a country and on the degree of accuracy aimed at, with due consideration of the time and means available; also notes on the method of observing horizontal angles and directions in geodetic surveys. By Charles A. Schott, assistant United States Coast and geodetic survey. pp. 391–399.

    12 fig.
    Reprinted, with additions, from the Report for 1871, appendix no. 15.

21. On a chart of the magnetic declination in the United States, constructed by J. E. Hilgard, assistant United States Coast and geodetic survey. pp. 400, 401.

    1 map.

22. A statement concerning the relation of the lawful standards of measure of the United States to those of Great Britain and France. By J. E. Hilgard, assistant United States Coast and geodetic survey. pp. 402–406.

    CONTENTS.—Measures of weight, of capacity, of length; relation of yard to metres. Annex I, an act to authorize the use of the metric system of weights and measures; measures of length, of surface, of capacity, weights. Annex II, comparison of yards and metres.

*23. List of publications relating to the deep-sea investigations carried on in the vicinity of the coasts of the United States under the auspices of the Coast survey. pp. 407–409.

*Addendum to appendix 15. Table showing the mode of reducing the experiments. pp. 410–416.

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* Exhausted.

## 1877

Report of the Superintendent of the United States coast survey, showing the progress of the work for the fiscal year ending with June, 1877. Washington: Government printing office. 1880.

xxiii, 192 pp. 7 fig., 25 maps and sketches. 30cm.

C. P. Patterson, superintendent.
Also published as Senate ex. doc. 12, 45th Cong., 2d sess. In v. 4.

APPENDICES.

*1–5. [Field and office details.] pp. 71–83.

6. The Pamplico-Chesapeake arc of the meridian and its combination with the Nantucket and the Peruvian arcs, for a determination of the figure of the earth from American measures. Report by Charles A. Schott, assistant. pp. 84–95.

CONTENTS.—Base lines; latitudes; azimuths; combination of arcs of the meridian; equations; Nantucket arc; Pamplico-Chesapeake arc; Peruvian arc; combination of arcs for determining the figure of the earth considered as a spheroid; table of data for figure of the earth, Bessel, 1841, Clarke, 1866, Coast survey, 1877.

*7. The magnetic observatory at Madison, Wis. Report by Charles A. Schott, assistant. pp. 96, 97.

*8. Notes concerning alleged changes in the relative elevations of land and sea. Report by Henry Mitchell, assistant. pp. 98–103.

CONTENTS.—Salt marshes; rocks; Percé rock; Isle Percé; Green ledge; Mary Ann rocks; Bulwark shoal; Drunken ledge; Brazil rock; Jig rock; Trinity ledge; Harding's ledge; Great ledge.

9. Description of an apparatus devised for observing currents in connection with the physical survey of the Mississippi river. Report by H. L. Marindin, assistant. pp. 104–107.

2 fig.

10. Description of an optical densimeter for ocean water. J. E. Hilgard, assistant. pp. 108–113.

1 fig.

11. An examination of three new 20-inch theodolites. Report by J. E. Hilgard, assistant. pp. 114–147.

1 fig.

12. Comparison of American and British standard yards. Report by J. E. Hilgard, assistant. pp. 148–181.

13. Description of an improved open vertical clamp for the telescopes of theodolites and meridian instruments, devised by George Davidson, assistant United States Coast survey. pp. 182–183.

1 fig.

14. Observations of the density of the waters of Chesapeake bay and its principal estuaries. Report by Lieut. Frederick Collins, United States Navy, assistant Coast survey. pp. 184–190.

CONTENTS.—Instruments employed; specific gravity; method of working; explanation of tables in the full report.
2 fig.

15. A quincuncial projection of the sphere, by C. S. Peirce, assistant. pp. 191, 192.

Tables I, II, of rectangular coordinates.
1 map.

## 1878

Report of the Superintendent of the U. S. coast and geodetic survey showing the progress of the work during the fiscal year ending with June, 1878. Washington: Government printing office. 1881.

xxiii, 306 pp. 1 fig., 1 pl., 30 maps and sketches, 9 diag. 30cm.

C. P. Patterson, superintendent.
Also published as Senate ex. doc. 13, 45th Cong., 3d sess. In v. 2.

APPENDICES.

*1–5. [Field and office details.] pp. 67–80.

6. Observations of the transit of Mercury, May 6, 1878, made at Summit station, Central Pacific railroad. Report by B. A. Colonna, assistant. pp. 81–87.

CONTENTS.—First external and internal contacts; second internal and external contacts; extracts from record book of observations, by B. A. Colonna; diagram; observation of contacts, by J. F. Pratt, assistant.
1 pl., 1 sketch (27).

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* Exhausted.

7. Observations made at Washington, D. C., of the transit of Mercury, May 6, 1878. Report of Charles A. Schott, assistant. pp. 88–91.

Observations by R. D. Cutts, William Eimbeck, and O. H. Tittmann, assistants.

8. Adjustment of the primary triangulation between the Kent island and Atlanta base-lines.—Charles A. Schott. pp. 92–120.

CONTENTS.—Arrangement of errors in closing triangles, in tabular form; average probable error. Paper 1, adjusted primary triangles between Kent island, Maryland, and Atlanta, Ga.; (2) estimation of the probable accuracy of a triangulation or approximate determination of the average probable error of the adjusted differences; (3) paper by M. H. Doolittle; I, general method of solution of normal equations; II, addition of new equations; III, order of solution; IV, selection of angle equations; V, treatment of small angles; example.
1 fig.

9. On a physical survey of the Delaware river in front of Philadelphia, by Henry Mitchell, assistant. pp. 121–173.

CONTENTS.—The channel; form of cross section; section 7½, Southwest pass, Mississippi river; the Delaware; location of the channel; cross section; transverse curves of velocity.
4 diag.

*10. Meteorological researches, Part II. By William Ferrel. pp. 175–267.

CONTENTS.—Chapter I. The theory of cyclones. Chapter II. Practical application of the theory and comparison with observation. Chapter III. Tornadoes, hailstorms, and waterspouts.
1 map, 5 diag. (Sketches 33 to 38.)

11. Discussion of tides in Penobscot bay, Maine, by William Ferrel. pp. 268–304.

CONTENTS.—I, general principles of the harmonic analysis and discussion of tide observations; II, p. 284, analysis of the tides of Pulpit cove; III, p. 296, comparison of observation with theory; IV, p. 299, practical application.
1 map.

## 1879

Report of the Superintendent of the U. S. coast and geodetic survey showing the progress of the work during the fiscal year ending with June, 1879. Washington: Government printing office. 1881.

xxv, 214 pp. 2 fig., 2 pl., 34 maps and sketches, 15 diag. 30$^{cm}$.

C. P. Patterson, superintendent.
Also published as Senate ex. doc. 17, 46th Cong., 2d sess. In v. 2.

### APPENDICES.

*1–5. [Field and office details.] pp. 77–94.

*6. Letter to Carlile P. Patterson, superintendent United States Coast and geodetic survey, Washington, D. C., from Alexander Agassiz, on the dredging operations carried on from December, 1878, to March 10, 1879, by the United States Coast survey steamer Blake, Commander J. R. Bartlett, U. S. N. pp. 95–102.

1 map.

7. Description of the Davidson meridian instrument, by George Davidson, assistant United States Coast and geodetic survey. pp. 103–109.

1 pl.

8. Comparison of local deflections of the plumb-line in latitude, longitude, and azimuth, at stations of the oblique arc along our Atlantic coast, as developed on Bessel's and Clarke's spheroids. By C. A. Schott, assistant Coast and geodetic survey. pp. 110–123.

1 diag.

*9. On the secular change of magnetic declination in the United States and at some foreign stations. By Charles A. Schott, assistant Coast and geodetic survey. pp. 124–174.

Fourth edition, June, 1881.
CONTENTS.—Definition; solar diurnal variation; annual variation; lunar inequalities; magnetic disturbances; historical note; the needle used among the Chinese and Norwegians; the declination; isogonic charts; secular variation of the declination; analytical expression of the secular change of the declination; collection of magnetic declination for the discussion of the secular change; United States; France; Canada; Cuba; Jamaica; Panama; New Granada; Brazil; Mexico; Sandwich islands; Alaska; Kamtchatka; Bermuda islands; Table I, formula for magnetic declination at various places; Table II, comparison of observed and computed magnetic declinations; sketch 38; Table III, number of observations; apparent probable error of observation; sketch 37; sketch 39; Table IV, decennial value of the magnetic declination computed from preceding equations.
2 maps, 1 diag.
For other editions see ed. 1, Rept. 1855, app. 48; Rept. 1856, app. 31, and Rept. 1859, app. 24. Ed. 2, Rept. 1874, app. 8. Ed. 3, Sep. pub. (1879). Ed. 5, Rept. 1882, app. 5. Ed. 6, Rept. 1886, app. 12. Ed. 7, Rept. 1888, app. 7. Ed. 8, Rept. 1895, app. 1.

10. Physical hydrography of the Gulf of Maine, by Henry Mitchell, assistant United States Coast and geodetic survey. pp. 175–190.

CONTENTS.—General description; tides and tidal currents; tables 1 to 7; Georges bank; tables 8, 9.
1 fig., 2 diag.

*11. Report on the preparation of standard topographical drawings, by Edwin Hergesheimer, assistant United States Coast and geodetic survey. p. 191.

This paper was afterwards republished as the first part of appendix 14 Rept. 1883.
8 diag. (Illus. 42 to 49, inclusive.)

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* Exhausted.

*12. On the reconstruction of the dividing engine of the Coast and geodetic survey. A report to the Assistant in charge of the office, by G. N. Saegmuller, chief mechanician. pp. 192–198.

CONTENTS.—Table of corrected screw readings for every degree; Table I, residual errors of graduation of theodolites nos. 5, 118, 133; Table II.
1 diag.

13. Addendum to a report on a physical survey of the Delaware river, by Henry Mitchell, assistant United States Coast and geodetic survey. pp. 199, 200.

1 diag.

14. On the internal constitution of the earth. By Benjamin Peirce. p. 201.

15. On instruments and methods used for precise leveling in the Coast and geodetic survey. Report by O. H. Tittmann, assistant. pp. 202–211.

CONTENTS.—Description of level; rod and target; adjustments (figs. 1 to 6); verification and adjustments of the rods; methods—(1) simultaneous double leveling in one direction; (2) leveling in opposite directions; method of observing (*a*, *b*, *c*, *d*); river crossing; bench marks; degree of precision; records and computations; curvature and refraction; temperature correction; table of curvature and refraction; form of record; form of computation; form of abstract of results.
1 fig., 1 pl., 1 diag.

16. Observations to determine the refraction on lines passing near a surface of water, made at different elevations across the Potomac river. Report by Andrew Braid, assistant. pp. 212, 213.

## 1880

Report of the Superintendent of the U. S. coast and geodetic survey showing the progress of the work during the fiscal year ending with June, 1880. Washington: Government printing office. 1882.

xxii, 419 pp. 4 fig., 12 pl., 48 maps and sketches, 28 diag. 30$^{cm}$.

C. P. Patterson, superintendent.
Also published as Senate ex. doc. 12, 46th Cong. 3d sess. In v. 2.

### APPENDICES.

*1–5. [Field and office details.] pp. 63–80.

6. Report on the results of the longitudes of the Coast and geodetic survey determined up to the present time by means of the electric telegraph, together with their preliminary adjustment by the method of least squares. By Charles A. Schott, assistant. pp. 81–92.

CONTENTS.—Atlanta and Washington; results for difference of longitude; review of the telegraphic longitude work; published results; method of combining results; table of results of differences of longitude; table of results determining subordinate stations; combination and adjustment of observed differences of longitude; diagram 33, conditional equations; resulting adjusted longitudes (west of Greenwich).
1 diag.

7. Explanation of apparatus for observation of telegraphic longitudes, with directions for its use. By Edwin Smith, assistant. pp. 93–95.

CONTENTS.—Description; adjustments; interchange of signals.
2 diag. (34 and 35).

8. Report on geodesic night signals, by Chas. O. Boutelle, assistant. pp. 96–109.

CONTENTS.—Considerations; different kinds of lights; conditions of the problem; experiments in North and South Carolina; operations at Sugar Loaf mountain in 1879; method of observing; comparison of day and night observations; expense.
1 fig., 1 pl., 1 diag. (36 and 37).

9. Comparison of the surveys of Delaware river in front of Philadelphia, 1843 and 1878. By H. L. Marindin, assistant. pp. 110–125.

6 diag.
Tables 1, 2. Supplement, p. 116; tables 3 to 10.

10. Report on comparison of surveys of Mississippi river in the vicinity of Cubitt's gap. By H. L. Marindin, assistant. pp. 126–134.

1 diag. (44).
Tables I to V.

11. Report on geodesic leveling on the Mississippi river. By Andrew Braid, assistant. pp. 135–144.

CONTENTS.—Bench marks; instrument; rods; method of observing; specimen of record; probable and mean error; abstract of results.
3 diag. (Sketches 45, 46, 47.)

12. Report on the blue clay of the Mississippi river. By George Little, Ph. D. pp. 145–171.

CONTENTS.—List of authorities; geological history of the Mississippi river; southern drift; bluff or loess; loess or loam; the Mississippi bottoms; Port Hudson; water; analysis.
Sketch 48.

*13. A treatise on the plane-table and its use in topographical surveying. By E. Hergesheimer, assistant. pp. 172–200.

CONTENTS.—Description; alidade; adjustments; field work; three-point problem; by construction; by trigonometry; determination of position by resection; Bessel's method by inscribed quadrilateral; by construction of similar triangles; determining the position of a fourth point by resection upon three fixed points; Lehmann's method; Netto's method; two-point problem; representation of the terrene; table of heights; heights by a vertical angle and distance; comparison of feet and metres; method of determining curves; adjustment of the new alidade for observation of altitudes; distance; stadia; composed of two parts, rod and telescope with vertical arc; focal distance; reduction of hypothenuse to base; projection for field sheets.
1 pl., 12 diag. (49 to 61.)

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* Exhausted.

*14. On the determination of time, longitude, latitude, and azimuth. By Charles A. Schott, assistant. pp. 201–286.

CONTENTS.—Part I—Determination of time. General remarks; description; adjustment; method of observation; equatorial intervals of threads; incomplete transits; corrections for rate of chronometer, for inclination, for inequality of pivots, for collimation, for deviation, for diurnal aberration; personal equation; chronometer correction; reduction of observations by least squares; probable error; example; weights; preparation for observing transits; example of record and computation of inequality of pivots; specimen of record for value of level by level-trier; tabulation of factors; table of factors for reduction of transit observations. Part II—Determination of longitude: (1) Telegraphic determination of longitude; (2) personal equation; specimen of record of results for difference of longitude; variability in personal equation; (3) weights to transit observations recorded on the chronograph; weights depending on the star's declination; weights to incomplete transits; reductions of observations for time; (4) disposition of telegraphic instruments in the observatory; arrangements I to VI; (5) concluding remarks. Part III—Latitude determination: (1) Talcott's method; (2) modification of instrument; (3) description; (4) adjustment; (5) selection of stars; (6) directions for observing; (7) bisection of stars off the meridian; (8) general expression for latitude; (9) determination of value of micrometer; (10) determination of value of level; (11) differential refraction; (12) reduction to the meridian; (13) form of record; (14) of reduction; (15) discussion of results; (16) combination of results by weights.—Examples to articles 9, 10, 13, and 14. Part IV—Astronomical azimuth: [Four plates.] (1) General remarks; (2) instruments; (3) general considerations; (4) methods; (5) observations of a close circumpolar star near elongation; (5*b*) observations with the transit in the vertical of a close circumpolar star, near its elongation; (6) at any hour angle; (7) computation by fundamental formula; (8) by Napier's analogies; (9) by development into series; (10) at equal intervals before and after culmination; (10*b*) near culmination with eyepiece micrometer, corrections; (10*c*) with pivot micrometer; (11) observations of sun for azimuth; (12) examples of record and reduction; line of collimation by reversal on star; table of local time of elongation and culmination of four circumpolar stars for 1885, latitude 40°, longitude 6h. west of Greenwich.

3 fig., 10 pl., 1 diag.

*15. A comparison of the relative value of the polyconic projection used on the Coast and geodetic survey, with some other projections. Prepared by Charles A. Schott, assistant. pp. 287–296.

CONTENTS.—Map projections classified and defined: square projection, the rectangular projection, the rectangular equal-surface projection, Cassini's projection, projection with converging meridians, projection by development of an intersecting cylinder, Mercator's projection; second group—Flamstead's projection, De Lorgna's Babinet's equal-surface projection, De l'Isle's conic projection, the simple conic projection, Murdoch's projection; third group—Lambert's projection, Bonne's, the polyconic; remarks on the history of Coast survey projections; formulæ for computation: (1) for an arc of a great circle of the sphere, (2) for the rhumb line on Mercator's projection, (3) for the straight line on Bonne's projection, (4) for the straight line on the polyconic projection; resulting distances, in nautical miles; resulting azimuths.

7 sketches.

*16. Report on the currents and temperatures of Bering sea and the adjacent waters. By Wm. H. Dall, assistant U. S. C. and G. survey. pp. 297–340.

CONTENTS.—Sources of information; surface temperature; tables of temperatures; pack ice; summer temperatures; the Kuro Siwo and its extensions; table of North Pacific sea temperatures; comparison of sea temperatures from observations by the *Challenger*, 1873 and 1875; currents of Bering sea; observations of the Tuscarora and Venus; those of Krusenstern, 1804–1806; notes by whalers and others; table of temperatures; of currents; observations off the coast of Asia; in the Arctic in general; in the vicinity of Point Barrow. Supplementary note: Additional observations in the Arctic sea; boundary line between the territory of the United States and Russia; diagram of surface and vertical isotherms; chart of currents.

2 maps.

17. An account of a perfected form of the contact-slide base apparatus used in the Coast and geodetic survey. By J. E. Hilgard, assistant. pp. 341–345.

1 diag. (Sketch 82, fig. 1 to 8.)

18. An attempt to solve the problem of the first landing place of Columbus in the New world, by Captain G. V. Fox. pp. 346–411.

CONTENTS.—Introduction; narrative and discussion; the track of Navarrete; of Varnhagen; of Washington Irving; of Capt. Becher; according to G. V. Fox; conclusion; summary. A, age of Columbus; B, mile and league of Columbus; C, variation of the compass in 1492; D, the log of Columbus across the Atlantic ocean, 1492; E, the vessels of Columbus.

1 map (no. 83).

19. An inquiry into the variation of the compass off the Bahama islands, at the time of the landfall of Columbus in 1492. By Charles A. Schott, assistant. pp. 412–417.

CONTENTS.—Remarks on the early use of the compass; at the time of Columbus; reckoning time; notes on the voyages of Columbus; line of no variation; corrections to the agonic line; track of Columbus across the Atlantic in 1492, in tabular form; conclusions.

1 map. (Sketch 84.)

## 1881

Report of the Superintendent of the U. S. coast and geodetic survey showing the progress of the work during the fiscal year ending with June, 1881. Washington: Government printing office. 1883.

xxiii, 471 pp. 12 fig., 11 pl., 40 maps and sketches, 16 diag. $30^{cm}$.

J. E. Hilgard, superintendent.
Also published as Senate ex. doc. 49, 47th Cong., 1st sess. In v. 3.

### APPENDICES.

*1–5. [Field and office details.] pp. 67–90.

*6. General index of scientific papers, methods, and results contained in the appendices of the annual reports of the United States Coast and geodetic survey, from 1845 to 1880 inclusive. By C. H. Sinclair, subassistant. pp. 91–123.

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*** Exhausted.**

7. Type forms of topography, Columbia river. By E. Hergesheimer, assistant. pp. 124–125.

Discussion of the forms of the hills and mountains of the basin of the Columbia river below Wallula, with diagrams.
7 fig., 1 map.

8. Terrestrial magnetism. Directions for magnetic observations with portable instruments. By Charles A. Schott, assistant Coast and geodetic survey. pp. 126–158.

Third and enlarged edition. For ed. 1 see Rept. 1872, app. 14; ed. 2 see Rept. 1875, app. 16.
CONTENTS.—Introductory remarks; selection of stations: I, determination of the magnetic declination; definition; finding the true meridian; adjustment of the theodolite and alt-azimuth instrument; formulæ for determining azimuth and time; reductions from sun observations and from observations on Polaris; adjustment of the declinometer and magnetometer; magnetic axis and scale values; solar diurnal variation of the declination at Toronto, Canada, at Philadelphia, Pa., and at Key West, Fla.; times and azimuths of Polaris at elongation for the use of surveyors in determining the true meridian; magnetic declination. II, determination of the magnetic inclination; instrument; dip circle; reversal of poles of dipping needles; dip by means of a loaded needle (the Mayer method); relative total intensity by means of the dip circle. III, absolute and relative measures of the magnetic force; units of measure of the magnetic force; the magnetometer; deflections; magnetic constants; oscillations; inequality of temperature; deflection for value of *q* (temperature coefficient); introduction of absolute for relative values of the horizontal force, as determined by oscillations alone; concluding remarks; formula for total force; constants for the conversion of intensity into different units; list of standard works on magnetism; forms of magnetometers, Kew dip circle.
Illustrations 34–37.

9. Terrestrial magnetism. Collection of results for declination, dip and intensity, from observations made by the United States Coast and geodetic survey between 1833 and 1882, July. By Charles A. Schott, assistant. pp. 159–224.

CONTENTS.—Introductory remarks; explanation of the tables of magnetic results; tables of magnetic results arranged alphabetically by countries, description of stations arranged in same order.

10. Meteorological researches. By William Ferrel. Part III.—Barometric hypsometry and reduction of the barometer to sea-level. pp. 225–268.

CONTENTS.—Chapter I, theory of barometric hypsometry. Chapter II, applications of the theory. Chapter III, reduction of the barometer to the sea level; hypsometrical tables. Errata in Part II.
Illustration 38.

11. Report on the oyster beds of the James river, Virginia, and of Tangier and Pocomoke sounds, Maryland and Virginia. By Francis Winslow, master U. S. Navy, assistant Coast and geodetic survey, commanding schooner Palinurus. pp. 269–353.

CONTENTS.—Methods of conducting the investigation; (1) delineation of the beds; tides; bottom and water specimens; substratum of bottom; currents; number of oysters to the square yard; temperature of the water; names and areas; report of the investigation conducted during the summer of 1878; description of the oyster beds; densities; comparison of densities—Tangier; currents; deposit; effect of gales and ice; Pocomoke sound; beds; densities; comparison of densities—Pocomoke; currents; deposits; effect of ice and gales; general information given by oystermen; conclusion; tables giving statistics of output and oyster fleet; destruction of oyster beds; their preservation; investigation of the Chesapeake bay west of Tangier and Smiths island; cluster of oysters and sponge from unworked beds of the Chesapeake; dredging results—Chesapeake bay; fecundity of the beds in the sounds; success of spatting at different seasons; also investigation of temperatures; changes in density of the water; area of oyster beds; description by Assistant Dall of "drill" or *astyris*; form of questions used in collecting information from oystermen; analysis of water from Tangier and Pocomoke sounds and Chesapeake bay, by Prof. Moore, U. S. Naval academy; curves showing difference of density of water at bottom; chart of James river, showing approximate limits of oyster beds; Tangier sound, charts showing approximate position of oyster beds.
7 pl, 3 maps, 15 diag. (Illustrations, 39–63.)

12. On the length of a nautical mile. By J. E. Hilgard. pp. 354, 356.

13. On a method of readily transferring the underground terminal marks of a base line. By O. H. Tittmann, assistant. pp. 357, 358.

14. On the flexure of pendulum supports. By C. S. Peirce, assistant. pp. 359–441.

15. On the deduction of the ellipticity of the earth from pendulum experiments. By C. S. Peirce, assistant. pp. 442–456.

1 fig.

16. On a method of observing the coincidence of vibration of two pendulums. By C. S. Peirce, assistant. pp. 457–460.

3 fig.

17. On the value of gravity at Paris. By C. S. Peirce, assistant. pp. 461–463.

18. Report on a new rule for currents in Delaware bay and river. By Henry Mitchell, assistant Coast and geodetic survey, in charge of physical hydrography. pp. 464–469.

CONTENTS.—Proposed new rule for the currents of Delaware river; currents of Delaware bay; "Station no. 4," outside of Cape Henlopen—light-house bearing nearly west by compass; manner of computing middle line; rule; currents of Delaware bay; currents of Delaware river; lines of high and low water in Delaware bay and river; progress of tide in Delaware bay and river.
1 fig.

## 1882

Report of the Superintendent of the U. S. coast and geodetic survey showing the progress of the work during the fiscal year ending with June, 1882. Washington: Government printing office. 1883.

xxiii, 565 pp. 27 fig, 32 maps and sketches, 17 diag. 30cm.

J. E. Hilgard, superintendent.
Also published as Senate ex. doc. 77, 47th Cong., 2d sess. In v. 4.

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*Exhausted.

APPENDICES.

*1-6. [Field and office details.] pp. 71-106.

7. Description and construction of a new compensation primary base apparatus, including the determination of the length of the corresponding five-metre standard bars. By Charles A. Schott, assistant. pp. 107-138.

10 fig., 2 diag.

8. Report of the measurement of the Yolo base, Yolo county, California. By George Davidson, assistant. pp. 139-149.

1 fig., 1 sketch, 2 diag.

*9. Field-work of the triangulation. By Richard D. Cutts, assistant. pp. 151-197.

Edition 3. Reprinted, with additions, from the Coast survey Report of 1868, app. 7, and from edition 2 Separate publication (1877).
11 fig.

10. On the construction of observing tripods and scaffolds. By C. O. Boutelle, assistant. pp. 199-208.

2 diag.

*11. Results of the transcontinental line of geodetic spirit-leveling near the parallel of 39°, executed by Andrew Braid, assistant United States Coast and geodetic survey. By Charles A. Schott, assistant. Part I.—From Sandy Hook. N. J., to Saint Louis, Mo. p. 209.

CONTENTS.—Determination of the mean tidal level at Sandy Hook; instrumental constants; probable error of results from geodetic spirit leveling; tables of results and descriptions of primary and secondary bench marks between Sandy Hook, N. J., and Hagerstown, Md.; sketch showing the position of the principal bench marks from Sandy Hook, N. J., to St. Louis, Mo.
2 fig., 1 diag. (Illustration 32½.)
Appears on p. 209 by title only. Printed in full on pp. 517-556.

*12. On the secular variation of the magnetic declination in the United States and at some foreign stations. By Charles A. Schott, assistant Coast and geodetic survey. pp. 211-276.

Fifth edition, November, 1882.
CONTENTS.—Solar-diurnal variation; annual variation; lunar inequalities; secular variation; magnetic disturbances; historical note; the declination; isogonic charts; the secular variation of the declination; analytical expression of the secular variation of the magnetic declination; collection of magnetic declinations, observed at various places in the United States and at some foreign stations, from the earliest to the present time; Table I, formulæ expressing the magnetic declination at various places; Table II, comparison of observed and computed magnetic declinations; Table III, annual change of the declination and other data; secular variation at Baltimore, Md., San Francisco, Cal., and at Paris, France; graphically represented for 1790 and 1885; chart of the secular change in the position of the agonic line of the North Atlantic between 1500 and 1900; Table IV, decennial values of the magnetic declination.
2 maps, 2 diag. (Illustrations 33-36.)
Other editions: Ed. 1, Rept. 1855, app. 48; Rept. 1856, app. 31; and Rept. 1859, app. 24. Ed. 2, Rept. 1874, app. 8. Ed. 3, Sep. pub. (1879). Ed. 4, Rept. 1879, app. 9. Ed. 6, Rept. 1886, app. 12. Ed. 7, Rept. 1888, app. 7. Ed. 8, Rept. 1895, app. 1.

*13. Distribution of the magnetic declination in the United States at the epoch January, 1885, with three isogonic charts. By Charles A. Schott, assistant. pp. 277-328.

CONTENTS.—Method of forming tables of observed magnetic declinations and corresponding values referred to epoch, January, 1885; a chart showing disturbed isogonics; table of results for Alaska, formed with a view of expressing the declination to 1885 in a function of the latitude $\phi$ and the longitude $\lambda$; discussion by Lloyd's formula; table of magnetic declinations, for the most part observed in the present century, reduced to the epoch, January 1, 1885, which forms the basis for the construction of three isogonic charts of the United States, nos. 38, 39, and 40.
3 maps, 1 diag.

14. Records and results of magnetic observations made at the charge of the "Bache fund" of the National academy of sciences, from 1871 to 1876. Under the direction of J. E. Hilgard, M. N. A. S., by H. W. Blair. pp. 329-426.

CONTENTS.—Magnetic survey, 1871-72; descriptions of stations; declinations for 1871-72; table of declinations, with an explanation of table; horizontal intensity for 1871-72; method of observing; tables of results for horizontal intensity, arranged by stations; table of general results for 1871-72; declination, dip, horizontal intensity; descriptions of stations for 1873; declination, local time, dip, horizontal intensity, general results for 1873.

15. Comparison of the survey of Delaware river of 1819, between Pettys and Tinicum islands, with more recent surveys. By Henry L. Marindin, assistant. pp. 427-432.

Different cross sections compared and changes noted.
3 diag. (sketches 41, 42, and 43).

16. Study of the effect of river bends in the Lower Mississippi. By Henry Mitchell, assistant. pp. 433-436.

CONTENTS.—Inductions; Table I, a comparison of air-line and river distances with mean depths, mean widths, and mean areas; Table II, bend effects in the Mississippi river; inferences; authority for data.
2 diag. (Sketch 44.)

17. Discussion of the tides of the Pacific coast of the United States. By William Ferrel. pp. 437-450.

CONTENTS.—Tides of Port Townsend, Astoria, San Diego; determination of the general constants.
3 diag. (Sketches 45, 46, 47.)

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* Exhausted.

18. Report on the Siemens electrical deep-sea thermometer. By Commander J. R. Bartlett, U. S. N., assistant Coast and geodetic survey. (Accompanied by a description of the apparatus, by Werner Suess.) pp. 451–457.

3 fig., 2 diag. (nos. 48, 49).

*19. Recent deep-sea soundings off the Atlantic coast of the United States. By Lieutenant J. E. Pillsbury, U. S. N., assistant Coast and geodetic survey. pp. 459–461.

Operations of the U. S. Coast survey steamer "Blake" in the examination of the western Atlantic basin during the years 1880, 1881, 1882, and 1883.
Illustration no. 50.

20. The total solar eclipse of January 11, 1880, observed at Mount Santa Lucia, California. By George Davidson, assistant. pp. 463–468.

2 diag.

21. A new reduction of La Caille's observations, made at the Cape of Good Hope and at Paris between 1749 and 1757, and given in his "Astronomiæ Fundamenta," together with a comparison of the results with the Bradley-Bessel "Fundamenta;" also a catalogue of the places of 150 stars south of declination —30°, for the epochs 1750 and 1830. By C. R. Powalky, Ph. D. pp. 469–502.

CONTENTS.—Prefatory note by J. E. Hilgard; observations with a sextant at Paris; Table I, right ascensions; Table II, declinations; Table III, declinations continued; Table III*a*, declinations, with sector, at Paris, continued; Table IV, declinations, with sextant at the Cape, compared with La Caille in his "Astronomiæ Fundamenta;" Table IV*a*, sextant at the Cape; Table IV*b*, sector at the Cape; Table V, mean declination for 1750 (corrected); results compared; Table VI, catalogue of 150 fixed stars, south of 30° declination, from La Caille's observations at the Cape of Good Hope, in his "Astronomiæ Fundamenta" for 1750.0 and for 1830.0, without regard to proper motions; report on the preceding reduction of La Caille's observations by Prof. C. H. F. Peters.

22. Report of a conference on gravity determinations, held at Washington, D. C., in May, 1882. pp. 503–516.

For pp. 517–556 see app. 11.

*23. Experimental researches on the force of gravity. By Charles S. Peirce, assistant. p. 557.

Title only. Printed in full in Rept. 1883 app. 19. pp. 473–487.

24. Tribute to the memory of Carlile P. Patterson, superintendent of the coast and geodetic survey from 1874 to 1881. pp. 559–563.

## 1883

Report of the Superintendent of the U. S. coast and geodetic survey showing the progress of the work during the fiscal year ending with June, 1883. Washington: Government printing office. 1884.

xxvi, 488 pp. 11 fig., 26 maps and sketches, 24 diag. $30^{cm}$.

J. E. Hilgard, superintendent.
Also published as Senate ex. doc. 29, 48th Cong., 1st sess. In v. 3.

APPENDICES.

*1–5. [Field and office details.] pp. 77–119.

6. Descriptive catalogue of publications relating to the Coast and geodetic survey and to Standard measures. Compiled by Edward Goodfellow, assistant. pp. 121–135.

7. A table of depths for the harbors on the coasts of the United States. pp. 137–237.

Tides; table of depths, Atlantic coast; table of depths, Gulf coast; table of depths, Pacific coast; table of depths, Pacific and Arctic coasts, Alaska, and eastern coast of Asia.

8. The estuary of the Delaware. A report by Henry Mitchell, assistant. pp. 239–245.

CONTENTS.—Introductory remarks; term estuary defined; table of half-tide dimensions of the estuary of the Delaware; mean depths, widths, and sectional areas for each nautical mile; progress of the tide in Delaware bay and river; discussion concerning tide; résumé of data used; estuary of the Delaware; table of widths, areas, and depths.
1 fig., 1 diag. (no. 25.)

9. Report on the harmonic analysis of the tides at Sandy Hook, by William Ferrel. pp. 247–251.

Introductory letter; results of the harmonic analysis of the tides at Sandy Hook.
1 map. (Sketch 26.)

10. Description of a maxima and minima tide-predicting machine. By William Ferrel. pp. 253–272.

CONTENTS.—Prefatory letter; introduction; mathematical theory of the tide-predicting machine; mechanical solution of the problem; construction of the machine; directions for setting and using; efficiency of the machine; appendix.
5 diag. (Sketches 27, 28, 29, 30, 31.)

11. Results for the length of the primary base-line in Yolo county, California, measured in 1881 by the party of George Davidson, assistant. Computation and discussion of results, by Charles A. Schott, assistant. pp. 273–288.

1 diag.

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*Exhausted.

12. Results of observations for atmospheric refraction on the line Mount Diablo to Martinez, California, in connection with hypsometric measures by spirit level, the vertical circle and the barometer, made in March and April, 1880, by George Davidson, assistant. Reported by Charles A. Schott, assistant. pp. 289–321.

    CONTENTS.—Introduction; observations of double zenith distances for the measure of refraction and of differences of height; zenith distances; hourly mean values; diurnal variation in angle of refraction, in the coefficient of refraction, and in error of computed differences of height; atmospheric pressure; atmospheric temperature; observations of atmospheric humidity; barometric differences of height; Dr. Jordan's formula; values of $\Delta h$, computed from Jordan and Rühlmann's formulæ, with apparent error in mean temperature $t$; comparison of Bauernfeind's theory of refraction with observations; comparison of Jordan's theory of refraction with observations; rate of change of temperature with altitude for the stratum of air; direction and force of the wind and state of the sky; diagram of the hypsometric measures.

    1 diag.

13. Account and results of magnetic observations made under the direction of the United States Coast and geodetic survey in cooperation with the United States Signal office, at the United States Polar station Ooglaamie, Point Barrow, Alaska; Lieut. P. Henry Ray, A. S. O., commanding post. Reduction and discussion by Charles A. Schott, assistant, Coast and geodetic survey. pp. 323–365.

    CONTENTS.—Part I, introduction; instructions for observers at Point Barrow, Alaska, and at Lady Franklin bay, north of Smith sound, Arctic ocean, with a plan for magnetic house for Point Barrow; memorandum furnished Point Barrow relief party, with plan for new observatory; notes on the mounting; the adjustment and the determination of instrumental constants of the Brooke differential magnetometers; (1) the declination or unifilar magnetometer; (2) the horizontal force or bifilar magnetometer; (3) the vertical force or balance magnetometer; geographical position of Ooglaamie station, Alaska; sketch of U. S. Polar station, Ooglaamie, Alaska. Part II, absolute measures; monthly values of the magnetic declination, dip, and intensity at Ooglaamie, December, 1881, to August, 1883. Part III. differential measures; hourly variations of the declination, horizontal, and vertical intensities, with bimonthly term-day readings, at Ooglaamie, December, 1881, to August, 1883, adjustments of the Brooke differential magnetometers; recapitulation of monthly mean values (inclusive of disturbances) of hourly readings of Brooke declinometer at Ooglaamie, Alaska, 1882–83; solar-diurnal variation of the declination, inclusive of disturbances; separation of the larger magnetic variations or so-called disturbances and their discussion; the bifilar magnetometer.

    10 fig., 1 map. (Illustration 34.)

*14. Report on the preparation of standard topographical drawings, by Edwin Hergesheimer, assistant, Coast and geodetic survey Second series. pp. 367, 368.

    List of drawings which represent various special types of topography, with topographical drawings to be used as guides for inking original plane-table sheets.

    16 diag. (Illustrations 35 to 50.)

*15. The transit of Mercury of November 7, 1881, as observed at Yolo base, California, by George Davidson and J. J. Gilbert, assistants. pp. 369, 370.

    CONTENTS.—Point of observation; instruments used; geographical position of station; progress of transit; condition of atmosphere at time of transit; topography of surrounding country; sun's disk, at time of ingress; atmospheric disturbances; similar disturbances of signals in the day-time observations of geodetic work; intense blackness of planet's disk; problematical planet Vulcan.

16. Observations of the transit of Venus of December 6, 1882, at Washington, D. C., and at Tepusquet station, California, and at Lehman's ranch, Nevada. By C. A. Schott, B. A. Colonna, William Eimbeck, and J. S. Lawson, assistants. pp. 371–378.

    CONTENTS.—Location of station at Washington; instruments and observers; contacts; errors of chronometer.

*17. Determinations of gravity and other observations made in connection with the Solar eclipse expedition, May, 1883, to Caroline island, South Pacific ocean. A report by E. D. Preston. pp. 379–381.

18. Field catalogue of 1278 time and circumpolar stars. Mean places for 1885.0. By George Davidson, assistant. pp. 383–471.

19. Determinations of gravity at Allegheny, Ebensburgh, and York, Pa., in 1879 and 1880. By Charles S. Peirce, assistant. pp. 473–487.

## 1884

Report of the Superintendent of the U. S. coast and geodetic survey, showing the progress of the work during the fiscal year ending with June, 1884. Washington: Government printing office. 1885.

xxviii, 622 pp. 8 fig., 23 maps and sketches, 3 diag. 30$^{cm}$.

J. E. Hilgard, superintendent.

Also published as House ex. doc. 43, 48th Cong., 2d sess. In v. 22.

APPENDICES.

*1–5. [Field and office details.] pp. 87–134.

    4 fig.

*6. Tables for the projection of maps, based upon a polyconic development of the Clarke spheroid, and computed from the equator to the pole. pp. 135–321.

    CONTENTS.—History of the projection tables of the survey; the Clarke spheroid; formulæ used in establishing tables; arrangement and explanation of the tables; graphic construction of polyconic projections for limited areas; conversion tables; lengths of degrees of the meridian; arcs of the parallel in metres; meridional arcs; coordinates of curvature.

    Second edition printed as Special Pub. 5.

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*Exhausted.

*7. Formulæ and factors for the computation of geodetic latitudes, longitudes, and azimuths. pp. 323–375.

Third edition.

Contents.—Direct and indirect methods; Bessel's and Puissant's solutions; formulæ for *d*L, *d*M, and *d*Z, discussed and established; example of L, M, Z, for primary triangulation; example of L, M, Z, for subordinate triangulation; the inverse problem; L, M, Z, form for inverse solution; log foctors A, B, C, D, and E between latitudes 23° and 65°, based on the Clarke spheroid of 1866; table of corrections to longitude for differences in arc and sine; table of values of $\log \frac{1}{\cos \frac{1}{2} dI}$; table of log F; formula and table for computing the spherical excess of triangles, based on the Clarke spheroid of 1866.

2 fig.

For ed. 1, see Rept. 1860, app. 36; ed. 2, Rept. 1875, app. 19.

8. The run of the micrometer. By George Davidson, assistant. pp. 377–385.

Contents.—Explanation of the expression in reference to an astronomical or geodetic instrument; conditions when a micrometer has and when it has not a run; discussion of formulæ for the determination of run, with examples; tabulation of the micrometer runs observed at station Northwest Yolo base; tables of the correction for the "run of microscope micrometers."

9. Connection at Lake Ontario of the primary triangulation of the Coast and geodetic survey with that of the Lake survey. Observations By Charles O. Boutelle, assistant. Discussion by Charles A. Schott, assistant. pp. 387–390.

Contents.—Probable errors of the horizontal directions of the Coast and geodetic survey; summary of resulting directions at Mount Hamilton; differences in the linear values of the lines Sodus–Oswego, Victory-Oswego, and Clyde–Victory; differences in the longitudes and latitudes of the stations Sodus and Oswego, and differences in the azimuth of the line Sodus to Oswego, as determined by the Coast and geodetic survey and the Lake survey; comparisons of the mean error of an angle as determined by each survey; junction in Illinois of the Coast and geodetic survey; transcontinental triangulation (through Assistant Fairfield's field computation) and the Lake survey arc of the meridian, vicinity of the Olney base.

1 map. (Ilustration 20.)

10. Results of a trigonometrical determination of the heights of the stations forming the Davidson quadrilaterals. California. Observations by George Davidson, assistant, 1876–1882. Discussion by Charles A. Schott, assistant, 1884. pp. 391–405.

Contents.—Accommodation of observations to Jordan's formulæ with auxiliary tables; vertical measures and computations of heights of stations; daily measures of the zenith distance of the same object; abstract of resulting zenith distances and of other data for the computation of heights involved in the Davidson quadrilaterals; resulting differences of heights; probable error of the resulting $\Delta h$ and their adjustment; adjustment of the measured differences of heights of stations forming the connection of the Yolo base with the principal triangulation; recapitulation of measures.

2 fig.

11. Longitudes deduced in the Coast and geodetic survey from determinations by means of the electric telegraph between the years 1846 and 1885. Second adjustment. By Charles A. Schott, assistant. pp. 407–430.

Contents.—Comparison of longitude work of the survey in 1890 with that of 1885; growth of the work; table of results; Table I, differences of longitude of stations, determined by the U. S. Coast and geodetic survey telegraphically between 1846 and 1884; Table II, differences of longitude, errors, and corrections; accuracy attained by the Survey of late years; adjustment of results by least squares; equations, coefficients, values of $C_1$ and of $\delta_1$; final values, $\lambda$, of longitudes from Greenwich, in accordance with decision of the International meridian conference, held at Washington, October, 1884; comparison with adjustment of 1880; tables of longitudes, $\lambda$, of the remaining stations, probable errors of adjusted longitudes; probable errors of the resulting longitudes of Washington, U. S. Naval observatory, and of Cambridge, Harvard college observatory; longitude of Detroit, Mich.; comparison of the U. S. Coast and geodetic survey result with the longitude used by the U. S. Lake survey; longitude of Ogden, Utah; comparison of the U. S. Coast and geodetic survey result with the value adopted by the U. S. Engineers; junction of the American and European systems of longitudes.

1 diag. (illus. 21).

12. Physical hydrography of Delaware river and bay. Comparison of recent with former surveys. By H. L. Marindin, assistant. pp. 431–434.

Contents.—Comparison of cross sections; changes in Delaware river between 1841 and 1881, and between 1840 and 1882.

2 diag. (Sketches 22, 23.)

*13. Geology of the sea bottom in the approaches to New York bay. By A. Lindenkohl, Coast and geodetic survey. pp. 435–438.

Contents.—Prefatory remarks; characteristics of sea bottom; (1) submarine valley; (2) clay bottom extending about 100 miles seaward; (3) deep ravine at the edge of the continental slope, the Hudson river fiord; geology of the sea bottom in the approaches to New York bay illustrated.

1 map. (Illustration 24.)

14. Determinations of gravity with the Kater pendulums at Auckland, New Zealand; Sydney, New South Wales; Singapore, British India, Tokio, Japan; San Francisco, Cal., and Washington, D. C. By Edwin Smith, assistant. pp. 439–473.

15. On the use of the noddy for measuring the amplitude of swaying in a pendulum support. By C. S. Peirce, assistant. pp. 475–482.

16. Note on the effect of the flexure of a pendulum upon its period of oscillation. By C. S. Peirce, assistant. pp. 483–485.

17. Description of a model of the depths of the sea in the Bay of North America and Gulf of Mexico. By J. E. Hilgard, superintendent. pp. 619–621.

Contents.—A detailed description of the model; oceanic depressions and terrestrial elevations contrasted: addendum giving effect of an assumed reduction in the depth of the sea of 100 fathoms.

1 map. (Illustration 25.)

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*Exhausted.

*18. Brief account of the exhibit made by the Coast and geodetic survey at the Southern exposition, Louisville, Ky. By H. W. Blair, assistant. pp. 489–493.

*19. History of discovery and exploration on the coasts of the United States. By J. G. Kohl, Ph. D. pp. 493–617.

CONTENTS.—(1) Discovery and exploration on the Atlantic coast from the time of the Northmen to De Vries in 1632; maps of the Atlantic coast of North America, or parts thereof, published between 1500–1770; (2) discovery and exploration of the Gulf of Mexico from Columbus, 1492–1502, to Charlevoix, 1722; titles and copies of maps illustrating Dr. Kohl's history of the discovery and exploration of the Gulf of Mexico; (3) discovery and exploration of the Pacific coast of the United States from 1532 to and including the United States exploring expeditions of the present century; titles of copies of maps of the Pacific coast of North America, or parts thereof.

## 1885

Report of the Superintendent of the U. S. coast and geodetic survey showing the progress of the work during the fiscal year ending with June, 1885. Washington: Government printing office. 1886.

xxiii, 516 pp. 4 fig., 1 pl., 26 maps and sketches, 19 diag. 30$^{cm}$.

Frank M. Thorn, superintendent.
Also published as House ex. doc. 18, 49th Cong., 1st sess. In v. 23.

APPENDICES.

*1–5. [Field and office details.] pp. 81–128.

6. The geographical distribution and secular variation of the magnetic dip and intensity in the United States. By Charles A. Schott, assistant. pp. 129–274.

CONTENTS.—Part I, explanation of the general table; magnetic dips and horizontal and total magnetic intensities in the United States and adjacent regions. Part II, secular variation of the magnetic dip; discussion of dip by least squares; annual values of magnetic dip at prominent stations and comparisons; changes in dip from 1830 to 1885; secular variation of the dip. Part III, secular variation of the horizontal component of the magnetic force and of the total intensity; annual values of magnetic horizontal force; secular variation of the horizontal intensity for northeastern United States, eastern United States, and for the western coast; secular variation of the total intensity of the magnetic force; secular variation of the direction of a freely suspended magnetic needle for the New England States, from 1820 to 1885; construction of isomagnetic maps of the United States, showing the distribution of the dip, and of the horizontal component and total value of the earth's magnetic intensity for the epoch January 1, 1885.
3 maps, 3 diag. (Illustrations 19–24.)

7. Collection of some magnetic variations off the coasts of California and Mexico, observed by Spanish navigators in the last quarter of the eighteenth century. Communicated by George Davidson, assistant. pp. 275–284.

CONTENTS.—Results obtained during the voyage of the frigate "Santiago" for discovery of north coast of California; frigate "Santiago" and schooner "Sonora;" Sr. Virey and Antonio Bucareli, commanding two frigates in expedition of 1779; voyage of 1788, vessels "Princessa" and "San Carlos," northern coast of California; voyage of the packet "San Carlos" from Ounalaska to San Blas (coincidently with frigate "Princessa"); voyage from San Blas to Nutka, 1790; record of the packet "Philipino," commanded by Fidalgo, in his voyage of discovery in 1790 from Nutka to Prince William, Cook's river, and return to Monterey; record of the sloop "Princess Royal," voyage from Santa Cruz to Straits of Fuca, year 1790, commanded by Don Manuel Quimper.

8. Geographical positions of trigonometrical points in the states of Massachusetts and Rhode Island, determined by the United States Coast and geodetic survey between the years 1835 and 1885, and including those determined by the Borden survey in the years 1832 to 1838. By Charles A. Schott, assistant. pp. 285–439.

CONTENTS.—Introduction and explanation of the table of positions; number of stations and location; other statistical matter; observers and years of observation; accuracy of the work; index of stations in Massachusetts; table of geographical positions determined in the state of Massachusetts, and connection with stations in the surrounding states; triangulations of 1832–1885.
2 maps. (Illustrations 25, 26.)

9. Results deduced from the geodetic connection of the Yolo base line with the primary triangulation of California. Also a reduction and adjustment of the Davidson quadrilaterals forming part of that triangulation. By Charles A. Schott, assistant. pp. 441–467.

CONTENTS.—Sketch of Yolo base connections; instruments used and method of observation; horizontal directions resulting from the local adjustment at each of the stations composing the Yolo base net of triangulation; determination of weights to directions in the adjustment of the triangulation; table of closing errors of the triangles forming the Yolo base figure, arranged in the order of the size of the triangles with the probable error of direction; adjustment of a triangulation net or of conditioned observations; application to the adjustment of the Yolo base net; correlative equations; normal equations; Yolo base net with solutions; probable error of the adjusted length of the primary side, Mount Helena to Mount Diablo; triangle side computation; formulæ for the computation of geodetic latitudes, longitudes, and azimuths sufficiently precise for sides of the largest triangles that may be directly measured; standard geodetic data for the computation of geographical positions; geodetic or standard latitude of Mount Helena, and geodetic or standard azimuth of direction, Mount Helena to Mount Diablo, for the Davidson quadrilaterals; geodetic results of the Davidson quadrilaterals, introducing the Yolo base into the primary triangulation of California.
1 fig.

10. On geodetic reconnaissance. By Charles O. Boutelle, assistant. pp. 469–481.

CONTENTS.—Primary triangulation and base lines; reconnaissance for stations of a primary triangulation; tables of values of curvature and refraction; three-point problem; two-point problem; computation of linear coordinates; selection of stations for secondary and tertiary triangulations.
3 fig., 2 diag. (Illustrations 27, 28.)

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*Exhausted.

11. A plea for a light on Saint George's bank. By Henry Mitchell, assistant. pp. 483–485.

CONTENTS.—Exact position unknown in early times; position now accurately known, but unmarked; its position with reference to important surrounding points; benefit to be derived from light-house; size of the fishing fleet on and crossing the bank; importance of light and horn as a guide to this fleet; great loss of life and vessels under present conditions; shoal directly on shortest route from New York to British channel, and near routes of ocean commerce of Massachusetts bay and Bay of Fundy; fishing fleet delayed for want of signal; loss of largest privateer of 1812 (the "Dart") on St. Georges; suggestion that memorial be erected in shape of light-house.

12. Comparison of transverse sections in the Delaware river, between old navy-yard and east end of Petty's island, for the years 1819, 1843, and 1878. By Henry L. Marindin, assistant. pp. 487, 488.

Explanation of sketches 29, 30, 31, 32, 33, 34, giving a comparison of the transverse sections of the Delaware at various points for the years 1819, 1843, 1878.

13. On the harmonic analysis of the tides at Governor's island, New York harbor. By William Ferrel. pp. 489–493.

Results of analysis with sketch showing positions of tide gauges at Governor's island and Sandy Hook; determination of general constants.
1 map. (Illustration 35.)

14. Report on deep-sea current work in the Gulf Stream. By Lieut. J. E. Pillsbury, U. S. N., assistant. pp. 495–501.

CONTENTS.—Letters of instruction; report; description of apparatus devised by Lieut. Pillsbury for observations of deep-sea currents, with diagram and detailed account of its use; observations made and lines run; chart showing locality of cross section A, between Fowey rocks and Gun Cay; charts showing position of current stations, cross section A, Gulf stream; illustrations 39 to 46, giving a graphic picture of the deep-sea current work.
1 pl., 2 maps, 8 diag.

15. Note on a device for abbreviating time reductions. By C. S. Peirce, assistant. pp. 503–508.

16. On the influence of a noddy on the period of a pendulum. By C. S. Peirce, assistant. pp. 509, 510.

17. On the effect of unequal temperature upon a reversible pendulum. By C. S. Peirce, assistant. pp. 511, 512.

*18. Tribute to the memory of Henry W. Blair, assistant. p. 513.

## 1886

Report of the Superintendent of the U. S. coast and geodetic survey, showing the progress of the work during the fiscal year ending with June, 1886. Washington: Government printing office. 1887.

xl, 435 pp. 4 fig., 2 maps and sketches, 1 diag. 30$^{\text{cm}}$.

Frank M. Thorn, superintendent.
Also published as House ex. doc. 40, 49th Cong., 2d sess. In v. 22.

APPENDICES.

*1–5. [Field and office details.] pp. 97–151.

*6. The solar (annular) eclipse of March 5, 1886. Times of observation at San Francisco, Cal. Reported by George Davidson, assistant. p. 153.

CONTENTS.—Prefatory letter; observations made at the Coast and geodetic survey station, Lafayette park, San Francisco, Cal., and at the Davidson observatory; observations of first and second contacts; instruments and observers.

7. An examination of some of the early voyages of discovery and exploration on the Northwest coast of America from 1539 to 1603. By Prof. George Davidson, A. M., Ph. D., assistant U. S. Coast and geodetic survey. pp. 155–253

CONTENTS.—Introduction; efforts to reconcile many of the discrepancies of the old Spanish, English, American, and French navigators; indomitable courage and perseverance of the old Spanish navigators; many of the positions of Ulloa, Cabrillo, Ferrelo, Drake, and Vizcaino can now be located; effort to follow the navigators day by day; some of the authorities cited; origin of name California; what it designated; principal work consulted; description of localities by the different navigators, Ferrelo, Cabrillo, Ulloa, and Vizcaino, with notes by Davidson, placed in four parallel columns; table of the landfalls of Cabrillo (C.) and Ferrelo (F)., with their names by Ulloa (U.), Drake (D.), and Vizcaino (V.), and the present names and latitudes. Index to appendix 7, 1886. Prefatory note; authorities and publications consulted or referred to; discoverers and explorers; harbors (ports) and anchorages, bays, channels, coves, gulfs, lagoons, straits; headlands; capes, points, bluffs; islands, reefs, and rocks; mountains and mountain ranges (sierras), table-lands (mesas); rivers and streams; settlements; Indian villages (pueblos); miscellaneous notices.
1 map. (Illustration 18.)

8. A report on Monomoy and its shoals. By Henry Mitchell, assistant, and Charles O. Boutelle, assistant. pp. 255–261.

CONTENTS.—Tonnage of the vessels navigating these waters; dangers to navigation; comparison of Capt. Paul Pinkham's survey of 1784 and the U. S. Coast and geodetic survey chart of 1885, with a sketch of the two surveys. Report concerning the earliest topographical survey of Monomoy, with sketch.
2 maps.

9. Report of changes in the shore line and beaches of Marthas Vineyard as derived from comparisons of recent with former surveys. By Henry L. Whiting, assistant. pp. 263–266.

Changes discussed; map showing changes in Cotamy beach, from surveys made in 1846, 1856, 1871, and 1886.
1 map. (Illustration 21.)

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* Exhausted.

10. A report on the delta of the Delaware. By Henry Mitchell, assistant. pp. 267–279.

    CONTENTS.—Joe Flogger shoal; method of comparing old and new surveys; diagram showing cross section of Joe Flogger shoal; results of comparisons; table giving comparative dimensions of Joe Flogger shoal; also a table for lower channel (Blake's) near Joe Flogger shoal, and a table for upper or main channel, near Joe Flogger shoal.
    1 fig. (Illustration 22.)

11. A report of Gulf Stream explorations—Observations of currents, 1886. By Lieut. J. E. Pillsbury, U. S. N., assistant. pp. 281–290.

    CONTENTS.—Detailed report of season's work, with a treatment of the subject, under the following heads: I, General characteristics of the Gulf Stream, as developed by the observations; II, Daily variation of the stream; III, Monthly variation of the stream; IV, Axis of the stream; V, Effect of wind on the velocity of the stream, and the position of its axis; VI, Depth of the stream, and velocity at different depths; VII, General summary for the guidance of navigators.
    6 diag. Plates (23 to 28) presenting curves of observations of currents in the Gulf Stream during 1885 and 1886.

12. The secular variation of the magnetic declination in the United States and at some foreign stations. (New and greatly enlarged edition.) By Charles A. Schott, assistant Coast and geodetic survey. pp. 291–407.

    Sixth edition, April, 1887.
    CONTENTS.—The magnetic declination; the solar-diurnal variation; the annual variation; the secular variation; magnetic disturbances or storms; historical note; the declination; isogonic charts; the secular variation of the declination; analytical expression of the secular variation of the magnetic declination; illustration representing graphically the secular variation of the magnetic declination at Paris, France, from 1540 to 1900; collection of observed magnetic declinations suitable for the investigation of the secular variation; Atlantic coast and region east of the Appalachian range, 43 stations, with results and comparisons; central part of the United States, between the Appalachian and Rocky mountain ranges, 24 stations; results and comparisons; magnetic declinations from the earliest to the present time, observed on or near the Pacific coast of the United States and west of the Rocky mountains, and extending over the region from the isthmus of Tehuantepec, Mexico, northward to Bering strait and the Arctic ocean, coast of Alaska; thirty-nine magnetic stations, mainly on the Pacific coast and in the region west of the Rocky mountains; results and comparisons; graphical illustration of the secular variation (illustration 31); secular change in the position of the agonic line of North Atlantic between 1500–1900 (illustration 33); progressive change in the secular variation, with a discussion of the subject; probable errors of some of the early observations.
    3 maps, 2 diag. (Illustrations 29–33.)
    Other editions: Ed. 1, Rept. 1855, app. 48; Rept. 1856, app. 31, and Rept. 1859, app. 24. Ed. 2, Rept. 1874, app. 8. Ed. 3, sep. pub. (1879). Ed. 4, Rept. 1879, app. 9. Ed. 5, Rept. 1882, app. 12. Ed. 7, Rept. 1888, app. 7. Ed. 8, Rept. 1895, app. 1.

13. On the circulation of the sea through New York harbor. A report by Henry Mitchell, assistant. pp. 409–432.

    CONTENTS.—Types of the tidal profiles; field work of 1885; current observations; East river tides and tidal currents; East river tides; lunar intervals of upper and lower restorations of level between Governor's island and Willet's point, with synchronous heights at other stations, from eight tides, maximum and minimum slopes; comparison of restorations of level; maximum slope (by reaches) of the East river; comparison of slopes, Governor's island to Willet's Point; intervals and heights of restoration of level between New York harbor (Governor's island) and Long Island sound (Willet's Point); currents; tables of variations of slope and velocity; decomposition of tides; comparison of mean levels, Governor's island and Willet's Point.
    3 fig., 3 diag. (Illustrations 34–39.)

## 1887

Report of the Superintendent of the U. S. coast and geodetic survey showing the progress of the work during the fiscal year ending with June, 1887. Washington: Government printing office. 1889.

xxxvii, 514 pp. 1 fig., 34 maps and sketches, 15 diag. 30cm.

Frank M. Thorn, superintendent.
Also published as House ex. doc. 17, 50th Cong., 1st sess. In v. 24.

### APPENDICES.

*1–5. [Field and office details.] pp. 95–157.

6. On the movements of the sands at the eastern entrance to Vineyard sound. By Henry Mitchell, assistant. pp. 159–163.

   CONTENTS.—Changes among the Monomoy shoals; tides and currents at the entrance of Vineyard sound; composition of tidal forces; tides at entrance of Vineyard sound graphically represented.
   1 map, 1 diag. (Illustrations 31, 32.)

7. Fluctuations in the level of Lake Champlain and average height of its surface above the sea. A preliminary report by Charles A. Schott, assistant. pp. 165–172.

   CONTENTS.—Fluctuations of the level of Lake Champlain, from observations by the United States Engineers at Fort Montgomery, N. Y., 1871 to 1882; fluctuations in the level of Lake Ontario, from observations at Charlotte harbor, 1859 to 1881; comparison of the state of Lake Champlain with the amount of rain (and melted snow) during the years 1871–1882; effect of wind; secular variation in the level of Lake Champlain; annual variation in the level of Lake Champlain and Lake Ontario, with annual variation in rainfall; secular variation in the levels of the two lakes; absolute height of Lake Champlain above the ocean; probable uncertainty of this result.
   1 diag. (Illustration 33.)

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* Exhausted.

8. Gulf Stream explorations—observations of currents—1887. A report by Lieut. J. E. Pillsbury, U. S. N., assistant. pp. 173-184.

CONTENTS.—Detailed report of season's work between Rebecca shoal and Cuba; between Cape San Antonio, Cuba, and Yucatan and Cape Hatteras shoal in a direction nearly southeast; (1) general characteristics and limit of the stream at each cross section; (2) daily variation; (3) axis of the stream; (4) depth of the stream, and velocity at different depths; (5) comparison of results obtained at various sections.

2 maps. 7 diag. (Illustrations 34-42.)

9. Heights from spirit-levelings of precision between Mobile, Ala., and Carrollton (New Orleans), La., by J. B. Weir, assistant, in 1885-'86. Report by Charles A. Schott, assistant. pp. 185-205.

CONTENTS.—Route of levels, date of leveling, observer, instruments, and instrumental constants; comparison of length and divisions of rods with standard on Saxton's dividing and comparing machine; method of observing; statistical information; computations; results; individual results and the necessary data to enable one to judge of the accuracy of the measures; resulting heights and probable uncertainties of the principal bench marks between Biloxi and Carrollton above the average Gulf level and a comparison of results from two levelings, *i. e.*, that by the Mississippi river commission and that by the Coast and geodetic survey; the resulting heights and probable uncertainties of the line Biloxi to Mobile; description of bench marks.

10. The magnetic work of the Greely Arctic expedition. Abstract of a report by Charles A. Schott, assistant. pp. 207-210.

CONTENTS.—Expeditions sent out in command of Lieut. Greely and Lieut. Ray; astronomical and magnetic work of Sergeant Israel; magnetic observatory at Fort Conger; determination of latitude, longitude, and azimuth; the number of magnetic observations and scheme for observing the declination; solar-diurnal variation; annual variation; hourly observations; term-day and term-hour observations; observations of oscillations; observations for dip; dates of aurora displays; tables of magnetic results derived from the work of other Arctic explorers; annual change in declination in this region; importance of a redetermination of the American pole of dip.

*11. Instructions and memoranda for descriptive reports to accompany original sheets, by F. M. Thorn, superintendent. pp. 211-215.

*12. General index to the progress sketches and illustrations, maps, and charts published in the annual reports of the U. S. Coast survey and U. S. Coast and geodetic survey from 1844 to 1885, inclusive. Prepared by Edward Goodfellow, assistant. pp. 217-268.

13. Addendum to a report on the estuary of the Delaware. By Henry Mitchell, assistant. pp. 269-273.

Table giving physical elements of the estuary of the Delaware, with introductory letter.
Supplementary to Rept. 1883, app. 8, pp. 269-273.

14. Report of the results of spirit-leveling of precision about New York bay and vicinity in 1886 and 1887. Observations by Assistant John B. Weir and Subassistant J. E. McGrath. Discussion by Charles A. Schott, assistant. pp. 275-300.

CONTENTS.—Route lines of levels, with map; observers and dates of leveling; instrumental constants; method of observing; computations; resulting elevations; result of geodetic leveling in the vicinity of New York, 1886-87; main line from Sandy Hook, N. J., to Dobbs Ferry, Hudson river, N. Y.; accuracy of the preceding results for heights; bench marks in the main line and branches of spirit levels, Sandy Hook to Dobbs Ferry.

1 map. (Illustration 43.)

15. Report on the results of the physical surveys of New York harbor. By Henry Mitchell, assistant. pp. 301-311.

CONTENTS.—Introductory letter: Part 1.—The underrun of the Hudson River; its relation to New York bar; diagram A; underrun in the Hudson in the dry season; densities at different depths, from observations taken in the summer of 1885; currents at different depths in various localities; currents at different depths, from observations for 1885; currents on the outer slope of New York harbor, 1885; depth of neutral plane below surface; limit of the tide, as affecting the scour of the channels in New York harbor. Part 2.—Courses of the Hudson tides through New York harbor; table of slopes of the Hudson and East rivers; tides (synchronous) in the tract of the Hudson.

1 fig., 6 diag. (Illustrations, 44-49.)

16. A bibliography of geodesy. By J. Howard Gore, B. S., Ph. D. pp. 313-512.

## 1888

Report of the Superintendent of the U. S. coast and geodetic survey showing the progress of the work during the fiscal year ending with June, 1888. Washington: Government printing office. 1889.

xxviii, 566 pp. 4 fig., 12 pl., 42 maps and sketches, 7 diag. $30^{cm}$.

Frank M. Thorn, superintendent.
Also published as House ex. doc. 22, 50th Cong., 2d sess. In v. 22.

### APPENDICES.

*1-5. [Field and office details.] pp. 97-166.

*6. Part I. The value of the "Arcano del mare" with reference to our knowledge of the magnetic declination in the earlier part of the seventeenth century. By Charles A. Schott, assistant. pp. 167-170.

2 maps.

Part II. Historical review of the work of the Coast and geodetic survey in connection with terrestrial magnetism. By Charles A. Schott, assistant. pp. 171-176.

4 fig.

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* Exhausted.

7. The secular variation of the magnetic declination in the United States and at some foreign stations. By Charles A. Schott, assistant Coast and geodetic survey. pp. 177–312.

   Seventh edition, June, 1889.
   CONTENTS.—The magnetic declination; secular variation of the magnetic declination at Paris, France; magnetic disturbances or storms; the declination; isogonic charts; the secular variation of the declination; analytical expression of the secular variation of the magnetic declination; collection of observed magnetic declinations suitable for the investigation of the secular variation.
   4 maps, 2 diag.
   *Footnote to first page.*—This article originally appeared in the Coast survey Report for 1855, appendix 48, and was continued in reports of 1856, 1858, and 1859, appendix 24, pp. 296–305. In the second edition, in Coast survey Report for 1874, appendix 8, pp. 72–108, the investigation appears greatly extended; the substitution of a sine for a cosine function was made, and the epoch was changed from 1830 to 1850; also some use was made of Cauchy's method of interpolation for the establishment of some second periodic terms. The third edition, issued in June, 1879, appeared in pamphlet form, and is not contained in any annual Report of the Coast and geodetic survey. The geographical range of the investigation was much enlarged, and the paper was illustrated by two plates. The next or fourth edition was brought out in June, 1881, and forms appendix 9, Coast and geodetic survey Report for 1879; it was illustrated with three plates. In the fifth edition, of November, 1882, appendix 12, Report for 1882, there were discussed 837 declinations, observed at 82 stations, situated in the United States and a few in Europe, South America, Asia, and Polynesia, the latter for the purpose of extending our knowledge of magnetic changes beyond our immediate seacoast. The sixth edition forms appendix 12, annual Report for 1886; it is distinguished by a more systematic arrangement of its contents and by a more liberal introduction of observations made at sea near our coasts; besides the number of stations to which the record and discussion extends is increased to 94, with an available material of 1,071 observed declinations. In the seventh edition the stations are increased to 102 and the number of declinations to 1,245. The Report for 1895, appendix 1, contains the eighth edition.

8. Geographical positions of trigonometrical points in the State of Connecticut, determined by the U. S. Coast and geodetic survey between the years 1833 and 1886. Introduction and explanation of the tabular results. By Charles A. Schott, assistant. pp. 313–403.

   CONTENTS.—Standard geodetic data of the survey; the unit of length; the geodetic surface of reference; the standard latitude; the standard longitude; the standard azimuth; descriptions of stations; positions of stations and connecting lines shown on map; reduction of observations; method used; table of logarithmic factors for the computation of geodetic positions, between latitudes $40^\circ\ 55'$ and $42^\circ\ 55'$; position computation; length of arc of one minute in meridian and in parallel; earth's curvature; positions arranged in geographical groups; observers and years of observation; computers engaged in work; metric conversion tables; errata in appendix 8, 1885; index of stations in Connecticut.
   map.

9. Tide levels and flow of currents in New York bay and harbor. Report by Henry L. Marindin, assistant. pp. 405–408.

   12 maps.
   Abstract of this appendix was printed as Bulletin 3, with 2 illustrations.

10. Heights from spirit-leveling of precision between Mobile, Ala., and Okolona, Miss. Observations by J. B. Wier, assistant, and J. E. McGrath, subassistant, in 1884, 1886, and 1887. Report by Charles A. Schott, assistant. pp. 409–426.

11. Heights from spirit-leveling of precision between New Orleans, La., and Wilkerson's landing, Miss., opposite Arkansas City, Ark. Report on reduction of observations and results by Charles A. Schott, assistant. pp. 427–453.

    Field work between New Orleans and Greenville, Miss., by O. H. Tittmann and Andrew Braid, assistants, and by John B. Weir, subassistant, in 1879, 1880, and 1881, and between Greenville, Miss., and Arkansas City, Ark., by the Mississippi river commission, in 1880 and 1881.

12. Heights from spirit-leveling of precision between Arkansas City (on the Mississippi river) and Little Rock, Ark. Observations by J. E. McGrath, subassistant, in 1887–88. Report by Charles A. Schott, assistant. pp. 455–464.

13. Differential method of computing the apparent places of stars for determinations of latitude. By E. D. Preston, assistant. pp. 465–470.

14. Determinations of latitude and gravity for the Hawaiian government. By E. D. Preston, assistant. pp. 471–563.

    CONTENTS.—Hawaiian pronunciation; instruments; journey and work accomplished; triangulation connections between the trigonometrical and astronomical stations, and geodetic latitudes of the latter (with sketch of triangulation); connection between latitude and gravity stations on the island of Maui; latitude; micrometer; level; results; observations and reductions for Honolulu; star catalogues consulted; mean places of Hawaiian latitude stars; gravity; description of stations; methods of observation; methods of reduction; island of Maui; contour lines and compartments; pendulum observations; density of the surface rock; reduction of the time observations; Caroline islands; gravity station of 1883; description of stations; pendulums; relative times of star observations and pendulum swings; instrumental constants and chronometer corrections; star residuals; pendulum observations; reductions to standard temperature and pressure; periods of oscillation.
    12 pl., 5 maps, 5 diag.
    Abstract printed as Bulletin 11.

## 1889

Report of the Superintendent of the U. S. coast and geodetic survey showing the progress of the work during the fiscal year ending with June, 1889. Washington: Government printing office. 1890.

xxx, 506 pp. 3 fig., 34 maps and sketches, 18 diag. $30^{cm}$.
T. C. Mendenhall, superintendent.
Also published as House ex. doc. 55, 51st Cong., 1st sess. In v. 27.

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* Exhausted.

APPENDICES.

*1-5. [Field and office details.] pp. 103-177.

*6. The relation between the metric standards of length of the U. S. Coast and geodetic survey and the U. S. Lake survey. A report by C. A. Schott and O. H. Tittmann, assistants, Coast and geodetic survey. pp. 179-197.

CONTENTS.—Committee metre; Repsold metre of 1876; Berlin metre no. 49, Toise du Pérou; comparison of the Repsold metre of 1876 (R. M.), U. S. Lake survey, and the Committee metre (C. M.), U. S. Coast and geodetic survey; description of the optical beam compass comparator; micrometers; micrometer values; illumination; thermometers; comparison of line and end metres; special device used with C. M.; places of observation; general adjustments; results; coefficients of expansion of the iron Committee metre (C. M.) and of the Repsold steel metre (R. M.); comparison of the Repsold metre of 1876 (or R. M.) with the Berlin metre no. 49 (or B. M.); resulting normal differences R. M.—B. M.; comparison of values for coefficient of expansion of the Berlin brass metre no. 40 (or B. M.); relation of the Committee metre to the Métre des archives and to the new International prototype metre. Abstract of record of comparisons.

2 fig., 1 diag.

*7. The need of a remeasurement of the Peruvian arc. By Erasmus D. Preston, assistant. pp. 199-208.

*8. Telegraphic determination of the longitude of a station on Mount Hamilton, California, and its trigonometrical connection with the Lick observatory. Field work by C. H. Sinclair, assistant, and R. A. Marr, subassistant. Reported by Charles A. Schott, assistant. pp. 209-212.

*9. Description of two new portable transit instruments for longitude work. Constructed at the office of the Survey from designs by Edwin Smith, assistant. pp. 213-216.

1 diag.
Published also as Bulletin 16.

10. Report on the measurement of the Los Angeles base line, Los Angeles and Orange counties, California. By George Davidson, assistant. pp. 217-231.

CONTENTS.—Previous base measurements at Los Angeles; base monuments; desirability of new base measurements; reconnaissance; location of the Los Angeles base line; base piers; marking stations; the reference or witness marks for the southeast base station; the base line leveled and preliminarily measured with 100-metre wire; half-kilometre marks and temporary marks on the base line; the movable cover for the base apparatus; the organization and movement of the party; foot plates of the trestles; comparisons of the base bars nos. 1 and 2, and the field standard no. 2; the comparators; the the operations of a day's measurement; first measurement; second measurement; third measurement; summary of the three measurements.

1 map, 3 diag.

11. The distribution of the magnetic declination in the United States for the epoch 1890. (Second edition.) By Charles A. Schott, assistant. pp. 233-402.

CONTENTS.—Work done by the Coast and geodetic survey relating to magnetic declinations; local disturbances in the distribution of the declinations, dip, and intensity; collection and arrangement of magnetic declinations; general distribution of data; declinations and values reduced to the year 1890; isogonic curves for the United States (exclusive of Alaska); distribution of the declination in Alaska and adjacent regions; analytical expression for the distribution in Alaska; isogonic curves for Alaska; magnetic meridians and parallels; construction of magnetic meridians for the United States (exclusive of Alaska).

3 maps, 1 diag. Illustrations: Plate No. 24, disturbed isomagnetic curves; Chart No. 25, isogonic curves for the United States (exclusive of Alaska) at the epoch 1890 (January); Chart No. 26, isogonic curves for Alaska and adjacent parts, with annual change of the declination, for 1890; Chart No. 27, magnetic meridians of the United States (exclusive of Alaska) and annual change of the declination for the epoch of 1890.

12. Encroachment of the sea upon the coast of Cape Cod, Massachusetts, as shown by comparative surveys. A report by Henry L. Marindin, assistant. pp. 403-407.

1 map.

13. Cross-sections of the shore of Cape Cod between Chatham and the Highland light-house. Report by Henry L. Marindin, assistant. pp. 409-457.

1 map.

14. Recent changes in the south inlet into Edgartown harbor, Marthas Vineyard. A report by Henry L. Whiting, assistant. pp. 459, 460.

1 map.

15. Results of spirit-leveling between tide-water at Annapolis, Md., and the Capitol bench-mark at Washington, D. C., from observations in 1875 by F. W. Perkins, assistant. Reported by C. A. Schott, assistant. pp. 461-466.

16. Gulf stream explorations. Observations of currents, 1888 and 1889. A report by Lieut. J. E. Pillsbury, U. S. N., assistant. pp. 467-477.

8 maps, 12 diag.

17. Report on the resulting length and probable uncertainty of five principal base-lines, measured with the compensation base apparatus, Bache-Würdemann, of the Coast survey, between the years 1847 and 1855, inclusive. Submitted by Charles A. Schott, assistant, Coast and geodetic survey. pp. 479-491.

CONTENTS.—Introductory remarks: Resulting length and probable uncertainty of the base lines measured on Dauphin island, Alabama, in 1847; on Bodies island, North Carolina, in 1848; on Edisto island, South Carolina, in 1850; on Key Biscayne, Cape Florida, in 1855; at Cape Sable, Florida, in 1855.

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* Exhausted.

**18. Report of George Davidson, assistant U. S. Coast and geodetic survey, appointed by the President of the United States as the delegate to the Ninth conference of the International geodetic association held at Paris, October, 1889. pp. 493-503.**

1 fig.

## 1890

Report of the Superintendent of the U. S. coast and geodetic survey showing the progress of the work during the fiscal year ending with June, 1890. Washington: Government printing office. 1891.

xxix, 780 pp. 29 fig., 17 pl., 35 maps and sketches, 20 diag. $30^{cm}$.

T. C. Mendenhall, superintendent.
Also published as House ex. doc. 80, 51st Cong., 2d sess. In v. 30.

### APPENDICES.

*1-7. [Field and office details.] pp. 107-197.

8. Results of the observations made at the U. S. Coast and geodetic survey magnetic observatory, at Los Angeles, California, in charge successively of Marcus Baker, acting assistant, Carlisle Terry, jr., subassistant, and Richard E. Halter, assistant, between the years 1882 and 1889. Part I.—Results of the absolute measures of the direction and intensity of the earth's magnetic force. Discussion and report by Charles A. Schott, assistant. pp. 199-241.

9. Results of the observations recorded at the U. S. Coast and geodetic survey magnetic observatory, at Los Angeles, Cal., in charge successively of Marcus Baker, acting assistant, Carlisle Terry, jr., subassistant, and Richard E. Halter, assistant, between the years 1882 and 1889. Part II.—Results of the differential measures of the magnetic declination. Discussion and report by Charles A. Schott, assistant. pp. 243-457.

   9 diag.

10. The Gulf Stream—A description of the methods employed in the investigation, and the results of the research. By John Elliott Pillsbury, lieutenant, U. S. Navy, assistant U. S. Coast and geodetic survey. pp. 459-620.

   CONTENTS.—Preface; introduction; I, general historical account of the Gulf Stream and its investigations up to the time of Franklin; II, Gulf Stream investigations from the time of Franklin to those made by the U. S. Coast survey; III, Gulf Stream investigations made by the U. S. Coast survey until 1884, and those contemporary with them; IV, outfit of the "Blake" for anchoring at sea and observing the currents; V, characteristics of the Gulf Stream in the Straits of Florida and in the Yucatan passage; VI, Gulf Stream off Jupiter inlet, and off Cape Hatteras—the equatorial current; VII, causes of the Gulf Stream and of Atlantic currents; VIII, conclusions.

   12 fig., 6 pl., 10 maps, 9 diag.

11. Report in relation to a portion of boundary line in dispute between the states of Maryland and Virginia. [By Henry L. Whiting, assistant.] pp. 621-623.

   The portion of the boundary line to be examined and located was near Hog island, in the Lower Potomac, and its course depended upon the method adopted of measuring the low-water line of the river.

12. Determinations of gravity and the magnetic elements in connection with the U. S. Scientific expedition to the west coast of Africa, 1889-1890. A report by E. D. Preston, assistant. pp. 625-684.

   16 fig., 10 pl., 1 map.
   Includes observations on some islands in the North and South Atlantic ocean.

13. On an approximate method for computing probable error. By Chas. H. Kummell, computing division, U. S. Coast and geodetic survey, pp. 685-687.

13. The determination, by the method of least squares, of the relation between two variables, connected by the equation $Y = AX + B$, both variables being liable to errors of observation. By Mansfield Merriman, Ph. D., professor of civil engineering in Lehigh university, late acting assistant U. S. Coast and geodetic survey. pp. 687-690.

14. On the use of observations of currents for prediction purposes. Report by John F. Hayford, tidal division, U. S. Coast and geodetic survey. pp. 691-703.

15. Comparison of the predicted with the observed times and heights of high and low water at Sandy Hook, New Jersey, during the year 1889. A report by Alex. S. Christie, in charge of the tidal division, U. S. Coast and geodetic survey office, of the results of an investigation made under his direction by John F. Hayford, tidal computer. pp. 705-714.

   2 diag.

16. On the relation of the yard to the metre. By O. H. Tittmann, assistant. pp. 715-720.

   This paper is a second edition of Bulletin 9, revised by the author, with statement of later comparisons, confirming his results.

17. International geodetic association. Ninth conference. Paris, October 3-12, 1889. Address of George Davidson, assistant U. S. Coast and geodetic survey, appointed as delegate to the association on the part of the United States. pp. 721-733.

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* Exhausted.

18. Historical account of United States standards of weights and measures, customary and metric; of the inception and construction of the national prototypes of the metre and the kilogramme; of their transportation from Paris to Washington; of their official opening and certification, and of their deposit in the office of weights and measures. Compiled by O. H. Tittmann, assistant, in charge of the office of weights and measures. pp. 735-758.
   1 fig., 1 pl.

19. Notes on an original manuscript chart of Bering's expedition of 1725-1730, and on an original manuscript chart of his second expedition; together with a summary of a journal of the first expedition, kept by Peter Chaplin, and now first rendered into English from Bergh's Russian version. By William Healey Dall. pp. 759-774.
   2 maps.

20. Notes on an early chart of Long Island sound and its approaches. By Charles Hervey Townshend. pp. 775-777.
   1 map.

## 1891

Report of the Superintendent of the U. S. coast and geodetic survey showing the progress of the work during the fiscal year ending with June, 1891. In two parts. Washington: Government printing office. 1892.

T. C. Mendenhall, superintendent.
Also published as House ex. doc. 43, 52d Cong., 1st sess. In v. 31 and v. 32.

Part I. [Report.]

xxxiii, 187 pp. 20 maps and sketches. 30$^{\text{cm}}$.

Part II. Appendices relating to the methods, discussions, and results of the Coast and geodetic survey. Washington: Government printing office. 1892.

746 pp. 26 fig., 6 pl., 5 maps, 23 diag. 23$^{\text{cm}}$.

APPENDICES.

1. Approximate times of culminations and elongations and the azimuths at elongation of Polaris for the years between 1889 and 1910. Submitted for publication as a Bulletin November 21, 1889, by Charles A. Schott, assistant, and chief of the computing division, and first published February 18, 1890. pp. 7-13.
   Reprinted from Bulletin 14.

2. On the determination of an azimuth from micrometric observations of a close circumpolar star near elongation by means of a meridian transit, or by means of a theodolite with eye-piece micrometer. Submitted for publication as a Bulletin December 12, 1890, and first published February 26, 1891. Report on method and example of computation by Charles A. Schott, assistant, and chief of the computing division. Observations by A. T. Mosman, assistant. pp. 15-19.
   Reprinted from Bulletin 21.

3. The secular variation and annual change of the magnetic force at stations occupied by E. D. Preston, assistant, U. S. Coast and geodetic survey, in connection with the U. S. Eclipse expedition to the west coast of Africa, in 1889-90, in charge of Prof. D. P. Todd. Discussion and report by C. A. Schott, assistant, and chief of the computing division. Submitted for publication March 16, 1891. pp. 21-39.

4. Results of the observations recorded at the U. S. Coast and geodetic survey magnetic observatory at Los Angeles, Cal., in charge successively of Marcus Baker, acting assistant, Carlisle Terry, jr., subassistant, and Richard E. Halter, assistant, between the years 1882 and 1889. Part III.—Results of the differential measures of the horizontal intensity. Discussion and report by Charles A. Schott, assistant. pp. 41-267.
   10 diag.

5. On the magnetic observations made during Bering's first voyage to the coasts of Kamchatka and eastern Asia in the years 1725 to 1730. Submitted for publication as a bulletin, December 12, 1890, and first published February 26, 1891. Discussion by C. A. Schott, assistant, and chief of the computing division. pp. 269-273.
   Reprinted from Bulletin 20.

6. On the reduction of hydrometer observations of salt-water densities. Submitted for publication, February 18, 1890, by O. H. Tittmann, assistant, in charge of the Office of standard weights and measures. Revised for republication, February 1, 1892. pp. 275-277.
   Second edition. First edition was printed as Bulletin 18.

*7. On an investigation of the relations of cold and warm ocean currents off the New England coast, by the U. S. Fish commission, with the coöperation of the U. S. Coast and geodetic survey. By William Libbey, jr., U. S. Fish commission. pp. 279-281.

8. On the changes in the shore lines and anchorage areas of Cape Cod (or Provincetown) harbor as shown by a comparison of surveys made between 1835, 1867, and 1890. A report by Henry L. Marindin, assistant. pp. 283-288.
   2 maps.

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*Exhausted.

9. Cross-sections of the shore of Cape Cod, Massachusetts, between the Cape Cod and Long Point light-houses. A report by Henry L. Marindin, assistant. pp. 289-341.

10. On observations of currents with the direction-current meter in the Straits of Florida and in the Gulf of Mexico, 1891. A report by E. E. Haskell, assistant. pp. 343-364.
    1 pl., 1 map., 7 diag.

11. Descriptive catalogue of publications relating to the U. S. Coast and geodetic survey, 1807-1890, and to U. S. Standard weights and measures, 1790-1890. Compiled by Edward Goodfellow, C. H. Sinclair, and J. B. Baylor, assistants. pp. 365-474.
    Republished as Special Pub. 2, 1898.

12. The transit of Mercury of May 9, 1881, as observed at Waikiki, Hawaiian islands. A report by E. D. Preston, assistant. pp. 475-477.

13. On observations for the variations of latitude made near Honolulu, Oahu, Hawaiian islands in coöperation with the work of the International geodetic association, and on determinations of gravity and the magnetic elements. A preliminary report by E. D. Preston, assistant. pp. 479-485.

14. Report of an expedition to Muir glacier, Alaska, with determinations of latitude and the magnetic elements at Camp Muir, Glacier bay. By Harry Fielding Reid, professor of physics at the Case school of applied science, Cleveland, Ohio. pp. 487-501.
    1 map.

15. Determinations of gravity with the new half-second pendulums of the Coast and geodetic survey at stations on the Pacific coast in Alaska, and at the base stations, Washington, D. C. and Hoboken, N. J. By T. C. Mendenhall, superintendent. pp. 503-564.
    1 fig., 3 pl., 1 diag.

16. Proceedings of the Topographical conference held at Washington, D. C., January 18 to March 7, 1892. pp. 565-746.
    25 fig., 2 pl., 1 map, 5 diag.

## 1892

Report of the Superintendent of the U. S. coast and geodetic survey, showing the progress of the work during the fiscal year ending with June, 1892. In two parts. Washington: Government printing office. 1893.

T. C. Mendenhall, superintendent.
Also published as Senate ex. doc. 37, 52d Cong., 2d sess. In v. 3 and v. 4.

Part I. [Report.]
xxxiv, 199 pp. 17 maps and sketches. 30cm.

Part II. Appendices relating to the methods, discussions, and results of the Coast and geodetic survey. Washington: Government printing office. 1894.
viii, 552 pp. 10 fig., 7 pl., 6 maps, 22 diag. 23cm.

### APPENDICES.

1. On the variation of latitude at Rockville, Md., as determined from observations made in 1891 and 1892 in coöperation with the International geodetic association, by C. A. Schott. pp. 1-51.
    Preface by T. C. Mendenhall. pp. 1, 2. Descriptions of instruments, etc., by Edwin Smith. pp. 2-17.
    2 fig., 2 pl., 2 diag.

2. On the variation of latitude at Waikiki, near Honolulu, Hawaiian islands, as determined from observations made in 1891 and 1892 in coöperation with the International geodetic association. A report by E. D. Preston, assistant. pp. 53-159.
    1 fig., 3 pl., 2 maps, 9 diag.

3. On the results of spirit leveling of precision between Okolona, Miss., and Odin, Ill., from observations made by J. B. Weir, assistant; Isaac Winston and P. A. Welker, subassistants, and F. A. Young, aid. A report by Charles A. Schott, assistant, and chief of the computing division. pp. 161-203.
    1 fig., 1 map.

4. On the results of spirit leveling of precision between Corinth, Miss., and Memphis, Tenn., from observations made in 1890 and 1891 by Isaac Winston, subassistant, and F. A. Young, aid. A report by Charles A. Schott, assistant and chief of the computing division. pp. 205-224.

5. On the tides and currents in the harbor of Edgartown and in Katama bay, Marthas Vineyard. A report by Henry L. Marindin, assistant. pp. 225-241.
    1 map, 3 diag.

6. On the changes in the ocean shore lines of Nantucket island, Massachusetts, from a comparison of surveys made in the years 1846 to 1887 and in 1891. A report by Henry L. Marindin, assistant. pp. 243-252.
    1 map, 3 diag.

7. Results of the observations recorded at the U. S. Coast and geodetic survey magnetic observatory at Los Angeles, Cal., in charge successively of Marcus Baker, acting assistant; Carlisle Terry, jr., subassistant, and Richard E. Halter, assistant, between the years 1882 and 1889. Part IV.—Results of the differential measures of the vertical force component, and of the variations of dip and total force. Discussion and report by Charles A. Schott, assistant. pp. 253–327.
   2 diag.

8. On the measurement of the Holton base, Holton, Ripley county, Indiana, and the St. Albans base, Kanawha county, West Virginia. pp. 329–503.
   CONTENTS.—Measurement of the Holton base: I, extracts from the records and from the reports of A. T. Mosman, assistant; II, the iced bar and tape base apparatus, and results of measures made with them on the Holton and St. Albans bases, by R. S. Woodward, assistant; III, the new secondary base apparatus of the Coast and geodetic survey as used in the measurement of the Holton base, Indiana. A report by O. H. Tittmann, assistant.
   2 fig., 2 pl., 2 diag.

9. Measure of the irregularity in one turn of the micrometer screw, and the relative value of each turn. A report by George Davidson, assistant. pp. 505–513.
   1 diag.

10. On the least square adjustment of weighings. A report prepared by direction of O. H. Tittmann, assistant, in charge of the Office of standard weights and measures, by John F. Hayford. pp. 515–527.

11. Results of magnetic observations at stations in Alaska and in the northwest territory of the Dominion of Canada. Observations at five stations in Alaska by J. E. McGrath and J. Henry Turner, assistants, U. S. Coast and geodetic survey, in the years 1889, 1890, and 1891. Discussion of results and comparison with other stations by Charles A. Schott, assistant. pp. 529–533.
    1 map.

12. On the direct synthetical method of adjusting a triangulation. By Chas. H. Kummell, computing division, U. S. Coast and geodetic survey. pp. 535–552.
    4 fig.

## 1893

Report of the Superintendent of the U. S. coast and geodetic survey, showing the progress of the work during the fiscal year ending with June, 1893. In two parts. Washington: Government printing office. 1894.

T. C. Mendenhall, superintendent.
Also published as Senate ex. doc. 19, 53d Cong., 2d sess. In v. 2.

Part I. [Report.]

xxix, 169 pp. 19 maps and sketches. 30cm.

Part II. Appendices relating to the methods, discussions, and results of the Coast and geodetic survey. Washington: Government printing office. 1895.

v, 639 pp. 48 fig., 18 pl., 6 maps, 2 facsim., 11 diag. 23cm.

### APPENDICES.

1. State laws authorizing officers of the United States Coast and geodetic survey to enter upon lands within state limits for the purposes of the Survey. pp. 1–18.

2. On the resulting heights from geodetic leveling along the transcontinental line of levels between St. Louis and Jefferson City, Mo., executed in the years 1882 and 1888, by Andrew Braid and Gershom Bradford, assistants, and Isaac Winston, subassistant. Discussion and report by Charles A. Schott, assistant and chief of the computing division. pp. 19–36.
   1 fig., 1 diag.

3. Phototopography as practiced in Italy under the auspices of the Royal military geographical institute, and as practiced in the Dominion of Canada under the auspices of the Department of the interior. Also a short historical review of other photographic surveys and publications on the subject. By J. A. Flemer, assistant. pp. 37–116.
   30 fig., 2 pl.

4. On photography as applied to obtain an instantaneous record of lunar distances for determinations of longitude. By C. Runge. pp. 117–124.
   Translated by J. A. Flemer.

5. On the measurement of base line with steel tapes and with steel and brass wires. By Edw. Jäderin. pp. 125–164.
   1 pl., 1 diag.
   Translated by J. H. Gore.

6. Fundamental standards of length and mass. pp. 165–172.
   This paper was first published as Bulletin 26, and was republished to give it a more permanent form. Appended to it will be found a third edition of the tables for converting customary and metric weights and measures.

7. Units of electrical measure. pp. 173–176.
8. Part I.—A historical account of the boundary line between the states of Pennsylvania and Delaware. Part II.—Detailed account of work on the Pennsylvania and Delaware boundary. By W. C. Hodgkins, assistant. pp. 177–222.
   1 fig., 3 maps, 2 facsim.
9. Proceedings of the Geodetic conference, held at Washington, D. C., January 9 to February 28, 1894. pp. 223–424.
   4 fig., 7 pl., 1 map, 1 diag.
10. On the preparation and arrangement of the exhibit of the United States Coast and geodetic survey at the World's columbian exposition. Report by D. B. Wainwright, assistant. pp. 425–439.
11. The variation of latitude at San Francisco, Cal., as determined from observations made by George Davidson, assistant Coast and geodetic survey, between May, 1891, and August, 1892. Discussion of results and report by Chas. A. Schott, assistant. pp. 441–508.
    2 diag.
12. Determinations of latitude, gravity, and the magnetic elements at stations in the Hawaiian islands, including a result for the mean density of the earth. 1891, 1892. A report by E. D. Preston, assistant. pp. 509–639.
    12 fig., 8 pl., 2 maps, 6 diag.

## 1894

Report of the Superintendent of the U. S. coast and geodetic survey showing the progress of the work during the fiscal year ending with June, 1894. In two parts. Washington: Government printing office. 1895.

W. W. Duffield, superintendent.
Also published as Senate ex. doc. 8, 53d Cong., 3d sess. In v. 3 and v. 4.

Part I. [Report.]

xvi, 165 pp. 20 maps and sketches. 30cm.

Part II. Appendices relating to the methods, discussions, and results of the Coast and geodetic survey. Washington: Government printing office. 1895.

615 pp. 10 fig., 4 pl., 5 maps, 5 diag. 30cm.

### APPENDICES.

1. Relative determinations of gravity with half-second pendulums, and other pendulum investigations. By G. R. Putnam, assistant; and a report on a geologic examination of some Coast and geodetic survey gravity stations. By G. K. Gilbert, geologist United States Geological survey. pp. 7–55.
   6 fig., 1 diag.
2. Telegraphic determination of the force of gravity at Baltimore, Md., from simultaneous pendulum observations at Washington and Baltimore. By E. D. Preston, assistant. pp. 57–70.
   1 fig.

*3. Standard geodetic positions in southeastern Alaska, depending on astronomical observations made during 1892, 1893, and 1894. By C. A. Schott, assistant. pp. 71–85.
   1 diag.

4. Distribution of the magnetic declination in Alaska and adjacent waters for the year 1895, and construction of an isogonic chart for the same epoch. By C. A. Schott, assistant. pp. 87–100.
   2 maps.

*5. The length of the Holton base line, Indiana, with related experimental measures during part of July, August, September, and October, 1891; A. T. Mosman, assistant, in charge of the party. Reported by Charles A. Schott, assistant. pp. 101–116.

*6. The length of the St. Albans base line, West Virginia, measured in October, 1892, R. S. Woodward, assistant, Coast and geodetic survey, in charge of the party. Reported by Charles A. Schott, assistant. pp. 117–123.

7. Manual of tides. Part III. Some connections between harmonic and nonharmonic quantities, including applications to the reduction and prediction of tides. By Rollin A. Harris. pp. 125–262.
   CONTENTS.—Preface; I, properties of compound wave having a predominating component; II, computation of nonharmonic quantities from harmonic tidal constants; III, reductions of observations made upon high and low waters; IV, to reduce results to their mean values; V, on the classification of tides; VI, prediction of tides; tables.
   1 fig., 3 diag.

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* Exhausted.

8. Notes on some instruments recently made in the instrument division of the Coast and geodetic survey office. Prepared by Edwin Smith, assistant, United States Coast and geodetic survey, and chief of the instrument division. pp. 263–275.

   4 pl.

9. Formulæ and tables for the computation of geodetic positions. (Fourth edition.) pp. 277–348.

   CONTENTS.—Formulæ and factors for the computation of geodetic latitudes, longitudes, and azimuths; for primary triangulation; for subordinate triangulation; for inverse problem; corrections to longitude for differences of arc and sine; values of log sec. ½ (Δϕ); converting meters to feet and feet to meters; converting kilometers to statute miles, and statute miles to kilometers; spherical excess of triangles; tables for M computed for the Clarke spheroid; logarithms of factors A, B, C, D, E, F, based upon the Clarke spheroid of 1866 and the metric system, between latitudes 18° and 72°.—C. A. Schott.

   2 fig.

   For ed. 1 see Rept. 1860, app. 36; ed. 2, Rept. 1875, app. 19; ed. 3, Rept. 1884, app. 7.

10. Geographic positions of trigonometric points in the State of Massachusetts, determined by the United States Coast and geodetic survey between the years 1843 and 1894, and including those determined by the survey made by Borden in the years 1832 to 1838. Second enlarged and revised edition. pp. 349–615.

    CONTENTS.—Introduction and explanation of the table of positions; log factors for the computation of geodetic positions; position computation for secondary and tertiary triangulation; form for inverse solution; tabular arc values expressed in metres; spherical excess log M.; stations and observers; tables for converting feet into metres and metres into feet, etc.; index of geographic positions, State of Massachusetts; table of geographic positions determined in the State of Massachusetts, and connections with stations in surrounding States; triangulations of 1832–1890 and of 1894.

    3 maps.

## 1895

Report of the Superintendent of the U. S. coast and geodetic survey showing the progress of the work during the fiscal year ending with June, 1895. Washington: Government printing office. 1896.

xx, 516 pp. 10 fig., 4 pl., 5 maps and sketches, 5 diag. 30cm.

Parts I and II in one volume.
W. W. Duffield, superintendent.
Also published as Senate doc. 25, 54th Cong., 1st sess. In v. 2.

### APPENDICES.

1. The secular variation in direction and intensity of the earth's magnetic force in the United States and in some adjacent foreign countries. By Charles A. Schott, assistant Coast and geodetic survey. Eighth edition. pp. 167–320.

   1 map, 3 diag.

   Printed previously as Ed. 1, Rept. 1855, app. 48; 1856, app. 31, and 1859, app. 24. Ed. 2, 1874, app. 8. Ed. 3, Sep. pub. (1879). Ed. 4, Rept. 1879, app. 9. Ed. 5, Rept. 1882, app. 12. Ed. 6, Rept. 1886, app. 12. Ed. 7, Rept. 1888, app. 7.

2. Abstract of resulting latitudes of some prominent stations in Alaska and adjacent parts, as astronomically determined during 1889–1895. Reported by C. A. Schott, assistant. pp. 321–332.

3. Abstract of resulting longitudes of some prominent stations in Alaska and adjacent parts, as astronomically determined during 1889–1895. Reported by C. A. Schott, assistant. pp. 333–344.

*4. Observations of the transit of Mercury on November 10, 1894, made at the Coast and geodetic survey office, Washington, D. C. pp. 345–346.

5. Report on the changes in the depths on the bar at the entrance to Nantucket inner harbor, Massachusetts, between the years 1888 and 1893. By H. L. Marindin, assistant. pp. 347–354.

   4 diag.

6. Notes on the specific gravity of the waters of the Gulf of Mexico and the Gulf Stream. By A. Lindenkohl. pp. 355–369.

   8 fig., 2 maps.

7. Graphic method of reducing stars from mean to apparent places. By E. D. Preston, assistant. pp. 371–380.

   3 diag.

8. Description of leveling rods designed and constructed for use in geodetic leveling operations. By Isaac Winston, assistant. pp. 381, 382.

   2 diag.

*9. Report on the Rueprecht balance belonging to the United States Office of standard weights and measures. Prepared by John F. Hayford, assistant, C. & G. S. pp. 383–392.

   2 pl.

10. Tables of azimuth and apparent altitude of Polaris at different hour angles. By G. R. Putnam, assistant. pp. 393–398.

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* Exhausted.

11. Subdivision 1. List of original topographic sheets, geographically arranged, registered in the archives of the United States Coast and geodetic survey from January, 1834, to December 31, 1895. Nos. 1 to 2209, inclusive. Subdivision 2. List of original hydrographic sheets, geographically arranged, registered in the archives of the United States Coast and geodetic survey from January, 1834, to December 31, 1895. Nos. 1 to 2222, inclusive. pp. 399–516.

## 1896

Report of the Superintendent of the U. S. coast and geodetic survey showing the progress of the work during the fiscal year ending with June, 1896. Washington: Government printing office. 1897.

xxiii, 722 pp. 5 fig., 24 maps and sketches, 5 diag. $30^{cm}$.

Parts I and II in one volume.
W. W. Duffield, superintendent.
Also published as Senate doc. 35, 54th Cong., 2d sess. In v. 2.

APPENDICES.

1. Distribution of the magnetic declination in the United States for the epoch January 1, 1900. Third edition. By Charles A. Schott, assistant. pp. 147–235.

   CONTENTS.—Introduction; most recent magnetic declinations observed in the United States and adjacent regions; the isogonic chart of the United States for the epoch January, 1900; construction of the lines of equal declination; table of the most recent magnetic declinations observed in the United States and adjacent regions, and referred to the epoch January 1, 1900.

   Three illustrations: No. 1, isogonic chart of the United States for the epoch January, 1900; No. 2, chart showing annual change of the magnetic declination for the period 1895–1900; No. 3, isogonic chart of Alaska for the epoch January, 1900.

2. Resulting heights from spirit leveling between Old Point Comfort and Richmond, Va., from observations made by J. B. Weir, subassistant, between September and November, 1884, and by I. Winston, assistant, between December, 1891, and February, 1892. Report by Assistant C. A. Schott. pp. 237–246.

   1 map.

3. Resulting heights from spirit leveling between Richmond, Va., and Washington, D. C., from observations made by J. B. Weir, subassistant, in September and October, 1883, and September and October, 1884, with releveling by J. B. Weir between Richmond and Fredericksburg, Va., in May and June, 1886, and verification leveling between the two cities by I. Winston, assistant, between April and June, 1895. By Charles A. Schott, assistant. pp. 247–260.

   1 map.

4. Resulting heights from spirit leveling between Washington, D. C., and Hagerstown, Md., from observations made by J. B. Weir, subassistant, between July and September, 1883. Report by Charles A. Schott, assistant. pp. 261–264.

   1 map.

5. Resulting heights from spirit leveling between Jefferson City, Mo., and Holliday, Kans., from observations by I. Winston, assistant, and F. A. Young, aid, between April 21 and October 13, 1891. Report by C. A. Schott, assistant. pp. 265–284.

   1 fig., 1 map.

*6. Establishment of the United States Naval observatory circle, and the determination of the geographical position of the center of the clock room. By E. D. Preston, assistant. pp. 285–291.

   1 fig., 3 diag.

7. A new solution of a principal geodetic problem. By Chas. H. Kummell, computer. pp. 293–303.

   1 fig.

*8. Tables of cross sections on the north shores of Nantucket and Marthas Vineyard, Massachusetts. By H. L. Marindin, assistant. pp. 305–346.

9. Field method of reducing portable transit time observations. By G. R. Putnam, assistant. pp. 347–352.

10. Determination of the constant of aberration from latitude observations with the zenith telescope at Honolulu, H. I., and San Francisco, Cal. Report by E. D. Preston, assistant. pp. 353–371.

    2 diag.

11. Compilation of the most recent information relative to the harbors, anchorages, and dangers to navigation in the vicinity of Chatham and Peril straits and Cook's inlet, Alaska. Arranged and compiled by Lieut. Hugh Rodman, U. S. N., assistant. pp. 373–393.

*12. Logarithms, their nature, computation, and uses, with logarithmic tables of numbers and circular functions to ten places of decimals. Part I. By W. W. Duffield, superintendent. pp. 395–722.

    2 fig.

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*Exhausted.

## 1897

Report of the Superintendent of the U. S. coast and geodetic survey showing the progress of the work during the fiscal year ending with June, 1897. Washington: Government printing office. 1898.

xxi, 774 pp. 143 fig., 17 pl., 22 maps and sketches, 12 diag. 30$^{cm}$.

W. W. Duffield, superintendent.
Also published as Senate doc. 345, 55th Cong., 2d sess. In v. 29.

APPENDICES.

1. Distribution of the magnetic dip and the magnetic intensity in the United States, for the epoch January 1, 1900. (Second edition.) By Charles A. Schott, assistant. pp. 159-196.

   3 maps.

2. The telegraphic longitude net of the United States and its connection with that of Europe. 1866-1896. Report by C. A. Schott, assistant. pp. 197-261.

   CONTENTS.—Introduction and general remarks; historical note; field and office practice for the determination of telegraphic longitudes; the telegraphic longitude net of the United States; abstract of individual results for difference of longitude; exhibit of variation in personal equation between four observers, and extending over a series of years; effect of the variation in latitude upon the resulting differences of longitude; adjustment of longitude net, method of reduction; resulting longitudes, table of; method and computation of probable errors of resulting longitudes; remarks on junction of the North American and European systems of longitudes; references to additional prominent longitude stations.
   1 map.

3. Resulting longitudes of Kadiak, Unalaska and Unga, Alaska, as determined chronometrically from Sitka in 1896, by the party under the charge of Fremont Morse, assistant. Report by Charles A. Schott, assistant. pp. 263-268.

4. Resulting heights from spirit leveling between Holliday and Salina, Kans., from observations by I. Winston, assistant, between July 11 and October 28, 1895. By Chas. A. Schott, assistant. pp. 269-283.

   1 fig.

5. Results of magnetic observations made in connection with the Greenland expedition of 1896, under charge of Prof. A. E. Burton. By G. R. Putnam, assistant. pp. 285-295.

   1 map, 1 diag.

6. Results of pendulum observations made in 1895 and 1896. By G. R. Putnam, assistant. pp. 297-311.

   1 pl., 1 map.

7. Notes relating to self-registering tide gauges as used by the U. S. Coast and geodetic survey. By J. F. Pratt, assistant. pp. 313-318.

   2 fig., 3 pl.

8. Manual of tides. Part I. Introduction and historical treatment of the subject. By Rollin A. Harris. pp. 319-469.

   CONTENTS.—Preface; 1, definitions; 2, digression on plane, or two-dimensional, water waves; 3, on the origin of tides; 4, general properties of tides and modes of reduction; 5, tidal work and knowledge before the time of Newton; 6, Newton to Laplace; 7, Laplace; 8, work since the time of Laplace.
   4 fig., 6 diag.

9. Manual of tides. Part II. Tidal observation, equilibrium theory, and the harmonic analysis. By Rollin A. Harris. pp. 471-618.

   CONTENTS.—Preface; 1, observation of tides; 2, astronomy, tidal components suggested, etc.; 3, the tide-producing potential; 4, development of the tide-producing potential; 5, the harmonic analysis of tidal observations; tables.
   8 fig., 2 pl., 2 diag.

10. Phototopographic methods and instruments. By J. A. Flemer, assistant. pp. 619-735.

    CONTENTS.—Preface; introduction; 1, fundamental principles of iconometry; 2, photographs on inclined planes; 3, phototopographic methods; 4, photogrammeters; 5, iconometers and perspectographs.
    125 fig., 2 pl.

11. The duplex base apparatus, and directions for its use in the field. By William Eimbeck, assistant. pp. 737-752.

    2 fig., 3 pl., 1 diag.

12. Report on the measurement of the Salt lake base line, in Utah. By William Eimbeck, assistant. pp. 753-774.

    1 fig., 6 pl., 1 map, 2 diag.

## 1898

Report of the Superintendent of the U. S. coast and geodetic survey showing the progress of the work from July 1, 1897, to June 30, 1898. Washington: Government printing office. 1899.

489 pp. 16 fig., 30 pl., 20 maps and sketches, 16 diag. 30$^{cm}$.

Henry S. Pritchett, superintendent.
Also published as Senate doc. 48, 55th Cong., 3d sess. In v. 5.
Introduction and historical sketch also printed separately under title, "General statement of administration and work of the Coast and geodetic Survey, with historical sketch from 1807 to 1898."

APPENDICES.

1. Resulting heights from spirit leveling between Salina and Ellis, Kans., from observations made by I. Winston, assistant, between July 2 and September 9, 1896. Report by C. A. Schott, assistant. pp. 179–193.

   CONTENTS.—Instruments; methods of observing; computations; results; description of bench marks.
   1 fig.

2. Resulting heights from spirit leveling between Ellis, Kans., and Hugo, Colo., from observations by I. Winston, assistant, between June 11 and November 17, 1897. Report by C. A. Schott, assistant. pp. 195–214.

   2 fig.

3. Resulting heights from spirit leveling between Hugo and Colorado Springs, Colo., from observations by I. Winston, assistant, between April 20 and July 8, 1898. Report by C. A. Schott, assistant. pp. 215–228.

   1 fig.

4. Inquiry into the relative value and need of a check of the Peruvian arc of 1736–1743. Report by C. A. Schott, assistant. pp. 229–232.

5. Physical observations made in connection with the Pribilof islands survey of 1897. Report by G. R. Putnam, assistant. pp. 233–241.

   CONTENTS.—Magnetic irregularities on St. George island; sea-water densities in the northeast Pacific and Bering sea; determination of the force of gravity on St. Paul island, Bering sea.
   1 fig., 1 map.

6. Report on the proceedings of the International geodetic association conference at Stuttgart, Germany, October 3d to 12th, 1898, and on geodetic operations in the United States. Report by E. D. Preston, assistant, executive officer Coast and geodetic survey, delegate on the part of the United States. pp. 243–260.

   CONTENTS.—International latitude service; gravity measures; figure of the earth; Peruvian arc; longitude—Paris, Greenwich; scientific institutions; geodetic operations in the United States.
   1 pl., 3 maps.

7. Determination of time, longitude, latitude, and azimuth. By J. F. Hayford, assistant, inspector of geodetic work. pp. 261–409.

   CONTENTS.—Introduction; 1, determination of time by means of the transit instrument; 2, the determination of the difference of longitude of two stations; 3, the determination of latitude by means of the zenith telescope; 4, the determination of the astronomical azimuth of a direction.
   9 pl., 3 diag.

*8. A plane table manual. By D. B. Wainwright, assistant. pp. 409–461.

   CONTENTS.—*a*, Preliminary statement; *b*, instruments and adjustments; *c*, field work.
   1 fig., 20 pl., 11 diag.

9. Problems in physiography, concerning salinity and temperature of the Pacific ocean. By A. Lindenkohl, U. S. Coast and geodetic survey. pp. 463–473.

   CONTENTS.—*a*, Bering sea; *b*, Okhotsk sea; *c*, central Pacific ocean.
   1 fig., 2 diag.

## 1899

Report of the Superintendent of the coast and geodetic survey showing the progress of the work from July 1, 1898, to June 30, 1899. Washington: Government printing office. 1900.

952 pp. 13 fig., 14 pl., 30 maps. 30$^{cm}$.
Henry S. Pritchett, superintendent.
Also published as Senate doc. 454, 56th Cong., 1st sess. In v. 42.

APPENDICES.

*1, 2. [Field and office details.] pp. 69–240.

   5 fig., 23 maps, 3 pl.

3. The International geodetic association for the measurement of the earth. By Erasmus D. Preston, assistant, Coast and geodetic survey, delegate on the part of the United States at the Twelfth general conference. pp. 241–269.

   CONTENTS.—Preface; I, Origin and growth; II, International geodetic convention; III, Administrative and scientific activity; IV, Proceedings of the XII general conference.
   1 map.

4. Determinations of gravity at the Polytechnic institute, Worcester, Mass., and at Columbia university, New York city, with pendulum apparatus B. By Edwin Smith, assistant. pp. 271–282.

   2 fig.

5. Resulting elevations from spirit leveling between Denver, Colo., and Rock Creek, Wyo., from observations by Isaac Winston, assistant, between May 12 and October 21, 1899. By Isaac Winston, assistant. pp. 283–298.

   1 fig.

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* Exhausted.

6. Resulting elevations from spirit leveling between Abilene, Kans., and Norfolk, Nebr., from observations by A. L. Baldwin, assistant, and B. E. Tilton, aid, between May 8 and October 17, 1899. By B. E. Tilton, aid. pp. 299-320.
   1 fig.

7. Resulting elevations from spirit leveling between Gibraltar, Mich., and Cincinnati, Ohio, from observations by O. W. Ferguson, assistant, between June 3 and November 28, 1899. Report by O. W. Ferguson, assistant. pp. 321-345.
   1 fig.

8. Precise leveling in the United States. By John F. Hayford, inspector of geodetic work and chief of the computing division. pp. 347-886.
   CONTENTS.—Introduction; Vicksburg, Miss., to Meridian, Miss., line; Little Rock, Ark., to Holliday, Kans., line; Colorado Springs to Limon, Colo., line; line across Florida; direct results of observations; instruments and methods; the level net, general adjustment; relative elevation of Gulf and Atlantic; computed elevations of principal points; index to elevations and descriptions of bench marks; list of precise elevations; descriptions of bench marks; settling and rising of rods and instrument; general information.
   3 fig., 8 pl., 2 maps.

9. General report upon the magnetic survey of North Carolina, with a brief historical sketch of the fundamental phenomena of the earth's magnetism. By James B. Baylor and Daniel L. Hazard, under the direction of L. A. Bauer, chief of division of terrestrial magnetism. pp. 887-938.
   CONTENTS.—Introduction; historical sketch of the fundamental phenomena of the earth's magnetism; general account of the magnetic survey of North Carolina; the variations of the magnetic declination; secular variation of the magnetic declination in North Carolina; distribution of the magnetic declination in North Carolina for the year 1900; directions to surveyors concerning the use of the county meridians; descriptions of the magnetic stations.
   2 pl., 2 maps.

10. The magnetic work of the United States Coast and geodetic survey. By L. A. Bauer, inspector of magnetic work and chief of division of terrestrial magnetism. pp. 939-952.
   CONTENTS.—Isogonic charts published by the Survey; isoclinic and isodynamic charts; magnetic observatories; magnetic work in the polar regions; secular variation investigations; magnetic survey of the country; state magnetic surveys; magnetic survey of ocean areas.

## 1900

Report of the Superintendent of the coast and geodetic survey showing the progress of the work from July 1, 1899, to June 30, 1900. Washington: Government printing office. 1901.

724 pp. 138 fig., 39 pl., 83 maps, 15 diag. 30cm.
Henry S. Pritchett, superintendent.
Also published as Senate doc. 68, 56th Cong., 2d sess.

### APPENDICES.

*1, 2. [Field and office details.] pp. 81-254.
6 fig., 45 maps, 3 pl.

3. The oblique boundary line between California and Nevada. By C. H. Sinclair, assistant, Coast and geodetic survey. pp. 255-484.
   CONTENTS.—Formation of California and Nevada; early surveys bearing on the eastern boundary of California; United States Coast and geodetic survey line, 1893-1899; tables, etc., showing the results in detail; description of astronomic transits; appendix; description of stations on the random and corrected lines.
   121 fig., 32 pl., 15 maps.

4. Proportions and spacing of Roman letters as ascertained from the best examples. By Williams Welch, draftsman, Coast and geodetic survey. pp. 485-494.
   2 fig.

5. The international latitude service at Gaithersburg, Md., and Ukiah, Cal., under the auspices of the International geodetic association, by Edwin Smith, assistant, United States Coast and geodetic survey, and Mr. F. Schlesinger, special observer. pp. 495-520.
   CONTENTS.—Variations of latitude; description of station, etc.
   1 fig., 2 pl., 2 maps, 2 diag.

6. Description of precise levels nos. 7 and 8, Coast and geodetic survey, 1900. By E. G. Fischer, chief of the instrument division. pp. 521-534
   CONTENTS.—Introduction; the material; the tripod; the instrument base and center; the supporting cylinder; the telescope; the levels; the level-reading device; the finish; the weight.
   2 fig., 2 pl., 1 diag.

7. Manual of tides. Part IVa. Outlines of tidal theory. By Rollin A. Harris. pp. 535-700.
   CONTENTS.—Preface; tidal forces and equilibrium tides; hydrodynamics; oscillating areas; concerning waves in deep water and long waves where the depth may vary; experiments with moderately long waves; small oscillations sustained by periodic forces; a partial explanation of the tides; on the classification of rivers, straits, bays, etc., with reference to their tidal movements; tables.
   6 fig., 21 maps, 12 diag.

8. The determination of the mean value of one revolution of a micrometer screw and the progressive and periodic errors of the screw, from observations on a circumpolar star near its elongation. By Edwin Smith, assistant. pp. 701-712.

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* Exhausted.

## 1901

Report of the Superintendent of the coast and geodetic survey showing the progress of the work from July 1, 1900, to June 30, 1901. Washington: Government printing office. 1902.

440 pp. 2 fig., 15 pl., 50 maps and sketches, 2 diag. $30^{cm}$.

O. H. Tittmann, superintendent.
Also published as Senate doc. 50, 57th Cong., 1st sess.

APPENDICES.

*1, 2. [Field and office details.] pp. 57-227.
50 maps.

3. On the measurement of nine base lines along the Ninety-eighth meridian. By A. L. Baldwin, computer and chief of party, with preface by John F. Hayford, inspector of geodetic work. pp. 229-302.
4. Extension of tables for the computation of geodetic positions to the equator. By John F. Hayford. pp. 303-339.
5. Determination of relative value of gravity in Europe and the United States in 1900. By G. R. Putnam, assistant. pp. 341-355.
6. Triangulation northward along the Ninety-eighth meridian in Kansas and Nebraska. By John F. Hayford, inspector of geodetic work. pp. 357-423.

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* Exhausted.

# BULLETINS.

Bulletins are issued by the Survey from time to time as material accumulates. They are intended to give early announcement of work accomplished or information of importance obtained, and in many cases anticipate the usual means of publication afforded by the Annual Reports. They are indexed when their number demands it, thus augmenting their value for preservation and reference.

## VOLUME I.†

United States Coast and geodetic survey. T. C. Mendenhall, superintendent. Bulletins. vol. 1. [Seal of the survey]. Washington: Government printing office. 1893.

Nos. 1 to 25. 1888–1892. 261 pp. 2 fig., 7 pl., 36 maps, 6 diag. $30^{cm}$.

1. Recent publications. 1888.

   pp. 1–4.

2. Notes on Alaska from recent surveys. 1888.

   pp. 3–6.

3. Tidal levels and flow of currents in New York bay and harbor. By Henry L. Marindin, assistant. 1888.

   pp. 7–12. 2 maps.
   Abstract of app. 9, Rept. 1888.

4. Resources of and developments in Alaska. By George Davidson, assistant. 1888.

   pp. 13–24.

5. The value of the "Arcano del mare" with reference to our knowledge of the magnetic declination in the earlier part of the seventeenth century. By Charles A. Schott, assistant. 1888.

   pp. 25–28. 2 maps.

6. Secular variation in the position of the agonic line of the North Atlantic and of America, between the epochs 1500 and 1900 A. D. By Charles A. Schott, assistant. 1888.

   pp. 29–43. 3 maps.

7. Historical review of the work of the Coast and geodetic survey in connection with terrestrial magnetism. By Charles A. Schott, assistant. 1888.

   pp. 35–40. 4 maps.

8. Currents of New York bay and harbor. Compiled by B. A. Colonna, assistant, from the notes of a physical survey by H. L. Marindin, assistant. (First edition.) 1888.

   pp. 41–43.
   Same. Ed. 2, 1889. This supersedes the first edition, the issue of which was suppressed.

9. On the relation of the yard to the metre. By O. H. Tittmann, assistant. 1889.

   pp. 45–50.

10. Report on the sounds and estuaries of North Carolina with reference to oyster culture. By Francis Winslow, lieutenant, U. S. N., assistant, U. S. Coast and geodetic survey, commanding schooner Scoresby. 1889.

    pp. 51–136. 2 maps, 1 diag.

    CONTENTS.—Introduction; preface; information desired; methods used in the survey; area examined; general description; descriptions of sections, with results of the work in detail; limits of projections, with areas of public and private oyster grounds; specific gravities; general summary of results; general condition of the oyster industry prior to 1887; recommendations for new legislation; history of the Shell fish commission; operation of the new law; method of locating lots; conclusion; appendix; an act to promote the cultivation of shellfish in the State, and form of application for private oyster grounds.

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† Not available for distribution in volume form.

11. Determinations of latitude and gravity for the Hawaiian government. By E. D. Preston, assistant. 1889.

pp. 137–142. 1 fig. and 3 progress maps.

CONTENTS.—Introductory remarks; relative gravity determinations; gravity results (with diagram); latitude determinations; geodetic connections and conclusions; map of Hawaiian islands, showing the primary triangulation, latitude, and gravity stations; sketch of Island of Maui, showing contour lines and compartments; sketch of triangulation, showing connection between latitude and gravity stations on the Island of Maui.

This Bulletin appears in full in appendix 14, Rept. 1888.

12. A syphon tide-gauge for the open seacoast. By Henry L. Marindin, assistant. 1889.

pp. 143–146. 1 diag.

13. Telegraphic determination of the longitude of Mount Hamilton, California. Field work by C. H. Sinclair, assistant, and R. A. Marr, subassistant. Report by Charles A. Schott, assistant. 1889.

pp. 147–150.

14. Approximate times of culminations and elongations and of the azimuths at elongation of Polaris for the years between 1889 and 1910. Prepared for publication by Charles A. Schott, assistant. 1890.

pp. 151–155. Reprinted in Rept. 1891, pt. 2, app. 1.

15. Verification of weights and measures. By O. H. Tittmann, assistant. 1889.

pp. 157, 158. 1 diag.

16. Description of two new transit instruments for longitude work. Constructed at the office of the Survey from designs by Edwin Smith, assistant. 1889.

pp. 161–164. 1 fig., 1 diag.

17. The relation between the metric standards of length of the U. S. Coast and geodetic survey and the U. S. Lake survey. A report by C. A. Schott and O. H. Tittmann, assistants, Coast and geodetic survey. 1889.

pp. 165–173.

18. Table for the reduction of hydrometer observations of salt-water densities. Prepared for publication by O. H. Tittmann, assistant. 1890.

pp. 175–177. A second edition was printed as appendix 6, Rept. 1891.

19. On the sounds and estuaries of Georgia with reference to oyster culture. A report by J. C. Drake, ensign, U. S. N., assistant, U. S. Coast and geodetic survey, commanding schooner Ready, 1889–1890. 1891.

pp. 179–209. 7 maps.

CONTENTS.—Preface; methods; limits of the area examined; description of the areas examined; general conclusions; densities; table of areas examined with reference to oyster culture; resolution authorizing the appointment of an oyster commission; State of Georgia; an act for the regulation and protection of oyster culture; form of application for oyster grounds; charts to accompany report on oyster survey of the following sounds, harbors, or rivers of Georgia: Tybee roads and Wassaw sound, Ossabaw sound, Vernon and Ogeechee rivers, St. Catherines sound, Sapelo sound, Doboy and Altamaha sounds, St. Simon sound, Brunswick harbor and Turtle river, and St. Andrews sound.

20. The magnetic observations made on Bering's first voyage to the coasts of Kamchatka and eastern Asia in the years 1725 to 1730. Discussion by C. A. Schott, assistant. 1891.

pp. 211–214. Reprinted in Rept. 1890, app. 5.

21. Determination of an azimuth from micrometric observations of a close circumpolar star near elongation, by means of a meridian or transit and equal altitude instrument or by means of a theodolite with eyepiece micrometer. Report on method, and example of computation by Charles A. Schott, assistant. Observations by A. T. Mosman, assistant. 1890.

pp. 215–218. Reprinted in Rept. 1891, pt. 2, app. 2.

22. Results of observations made to determine gravity and the magnetic elements at stations on the west coast of Africa, and on some islands in the North and South Atlantic, 1889–1890. By E. D. Preston. 1891.

pp. 219–223. 1 map, 7 pl.

23. The secular variation and annual change of the magnetic force at stations occupied by E. D. Preston, assistant, U. S. Coast and geodetic survey, in connection with the U. S. Eclipse expedition to the west coast of Africa in 1889–1890 in charge of Prof. D. P. Todd. Abstract of a discussion by C. A. Schott. 1891.

pp. 225–232.

24. Changes in the shore lines and anchorage areas of Cape Cod (or Provincetown) harbor, as shown by a comparison of surveys made between 1867 and 1890. By H. L. Marindin. 1891.

pp. 233–235.

25. Observations at Rockville, Md., for the variations of latitude in co-operation with the International geodetic association. I, Description of station, instruments, and methods of observing, by Edwin Smith, assistant. II, Reduction of the observations and discussion of results, by C. A. Schott, assistant. 1892.

pp. 237–261. 2 diag.

## VOLUME II.†

Treasury department. United States Coast and geodetic survey. Henry S. Pritchett, superintendent. Bulletins. vol. II. Washington: Government printing office. 1899.

Nos. 26 to 35. 1893-1896. 170 pp. 1 map, 3 diag. 23½$^{cm}$.

26. Fundamental standard of length and mass. By T. C. Mendenhall. 1893.
pp. 1-5.

27. Results of observations for the variations of latitude at Waikiki, Hawaiian islands, in co-operation with the work of the International geodetic association. By E. D. Preston. 1893.
pp. 6-20. 2 diag.

28. The constant of aberration as determined from a discussion of results for latitude at Waikiki, Hawaiian islands. By E. D. Preston. 1893.
pp. 21-34. 1 diag.

29. The methods and results of the U. S. Coast and geodetic survey as illustrated at the World's columbian exposition, 1893. 1893.
pp. 35-98.

30. Units of electrical measure. Approved for publication December 27, 1893. 1894.
pp. 99-104.

31. Legal units of electrical measure in the United States. Approved August 12, 1894. 1894.
pp. 105-108.

32. The constant of aberration as determined from observations of latitude at San Francisco, California. Discussion by E. D. Preston. Observations by George Davidson. 1895.
pp. 109-120.

33. The direction and intensity of the earth's magnetic force at San Francisco, California. By C. A. Schott. 1895.
pp. 121-126.

34. Distribution of the magnetic declination in Alaska and adjacent waters for the year 1895, with one chart. By C. A. Schott. 1895.
pp. 127-134.

35. Alaska. General information relating to the vicinity of Chatham and Peril straits, from a recent survey by the U. S. Coast survey steamer Patterson, Lieut. Commander E. K. Moore, U. S. N., commanding, and Cooks inlet and the region of the westward, by W. H. Dall, U. S. Geological survey. 1897.
pp. 135-170. 1 map.

## VOLUME III.†

Treasury department. United States Coast and geodetic survey. O. H. Tittmann, superintendent. Bulletins. vol. III. Washington: Government printing office. 1902.

Nos. 36-40 (including edition 4 of no. 40). 1897-1900. Paging irregular. 9 maps, 5 pl.

36. Table of depths for channels and harbors, coasts of the United States. Arranged and compiled by Gershom Bradford, assistant. 1897.
pp. 1-109.

37. Alaska. Hydrographic notes and sailing directions relating to portions of Alaska from Dixon entrance to Yakutat bay, including reconnoissance surveys of Cordova bay, Bucarelli bay, and Red Fish bay. 1897. By Lieut. Commander J. F. Moser, U. S. N., commanding "Albatross." Published through the courtesy of the Fish commission. 1899.
pp. 110-118. 3 maps.

38. Alaska. Hydrographic notes, sailing directions, and charts of surveys relating to the vicinity of Prince William sound, Cook inlet, Kadiak island, and route from Unalaska to Chignik, through Unimak pass and inside the islands. 1897. By Lieut. Commander J. F. Moser, U. S. N., commanding "Albatross." Published through the courtesy of the Fish commission. 1899.
pp. 119-142. 6 maps.

39. Alaska. Predicted times of slack water at Seymour narrows, Discovery passage, B. C., and at Sergius narrows, Peril strait, Alaska, from May to December, 1899. Prepared from observations by Lieut. Commander E. K. Moore, U. S. N., assistant Coast and geodetic survey, commanding U. S. C. and G. S. steamer Patterson. 1899.
pp. 143-150.

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† Not available for distribution in volume form.

40. Alaska. Coast pilot notes on the Fox islands passes, Unalaska bay, Bering sea, and Arctic ocean as far as Point Barrow. Prepared by the Coast and geodetic survey, and revised by Lieut. D. H. Jarvis, U. S. R. C. S. [First edition.] 1899.

pp. 151-204. 5 charts. Without index.
Ed. 2* issued April 2d, 1900. Paged independently. pp. 1-60, with index.
Ed. 3* issued April 6th, 1901. pp. 1-64, with index.
Ed. 4* issued April 15th, 1902. pp. 1-73, with index.

## VOLUME IV.†

41. Magnetic survey of North Carolina. Values of the magnetic declination at the county seats from 1750 to 1910. Prepared by D. L. Hazard, computer, division of terrestrial magnetism. 1901.

pp. 1-12.

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* Exhausted. † Not available for distribution in volume form.

# SPECIAL PUBLICATIONS.

This series contains publications on special subjects, which could not be conveniently included in the Annual Reports.

1. California, Bay of San Francisco. Magnetic ranges for determining the deviation of the compass, with short explanations of how to find the deviation and error of the compass. Arranged and compiled by Lieut. J. C. Gilmore, United States Navy, assistant U. S. Coast and geodetic survey. 1898.

7 pp. 5 pl., 1 map. $23^{cm}$.

*2. Bibliography. Descriptive catalogue of publications relating to the U. S. Coast and geodetic survey, 1807-1896 and to U. S. Standard weights and measures, 1790 to 1896. 1898.

118 pp. $23^{cm}$. For previous edition see Rept. 1891, app. 11, pp. 365-474.

*3. Atlas of the Philippine islands. Washington: Government printing office. 1900.

24 pp. 30 maps. Bound in green cloth. The English title page is preceded by a title page in Spanish. "Atlas de Filipinas. Coleccion de 30 mapas. Trabajados por delineantes Filipinos bajo la direccion del P. José Algué, S. J., Director del observatorio de Manila. 1899."

Also published as Senate doc. 138, 1st sess., 56th Cong. (Atlas to the Report of the first Philippine commission.) Also as supplementary part to the two volumes edition of "El Archipelago Filipino. Washington: Imprenta del Gobierno 1900."

4. The Transcontinental triangulation and the American arc of the parallel. By Assistant Chas. A. Schott, chief of the computing division.

871 pp. 2 fig., 17 pl., 4 maps, 33 diag. $30^{cm}$. (Treas. dept. doc. 2173.)

CONTENTS.—Unit of length, base lines and base nets; determination of heights of stations; triangulation and its connection with the base nets; result of the astronomic determinations of latitude, azimuth and longitude; the geographic positions and comparison of the astronomic and geodetic results; preliminary combination of American arcs for determining the earth's figure.

*5. Tables for a polyconic projection of maps, based upon Clarke's reference spheroid of 1866. Second edition. 1900.

321 pp. $30^{cm}$. 1900. For first edition see Rept. 1884, app. 6, pp. 135-321.

6. Notes relative to the use of charts issued by the United States Coast and geodetic survey. By D. B. Wainright.

23 pp. 1 fig., 1 pl., 6 diag. $24^{cm}$. 1900.

7. The Eastern oblique arc of the United States and osculating spheroid. By Chas. A. Schott, assistant, Coast and geodetic survey.

394 pp. 12 pl., 2 maps, 25 diag. $30^{cm}$. 1902. (Treas. dept. doc. no. 2232, Coast and geodetic survey.)

CONTENTS.—The base lines and base nets; main triangulation; astronomic measures; determination of an osculating spheroid for the region covered by the triangulation.

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* Exhausted.

# SEPARATELY ISSUED PUBLICATIONS.

For various reasons papers have been published on a variety of professional, scientific, or historical subjects in separate form and without serial number. They are here listed from the beginning, in the order of their issue. Only a few of these have also been printed in the Annual Reports. They are special publications without a serial number.

These publications vary greatly in sizes and style of printing, the form being determined largely by the purpose they are intended to serve. Some of them, such as tables, etc., are printed on cardboard for use in the field; and others, such as star catalogues, larger in size, are printed and substantially bound with reference to similar use.

**1850.** Sailing directions to accompany the new chart of the western coast of the United States. A. D. Bache. [1850.]*

**1851.** Notes of the western coast of the United States. A. D. Bache. [1851.]*

**1858.** Special report on the comparative progress and expenditure of the Coast survey, in different years. Foreign surveys, etc. Washington. Printed by Henry Polkinhorn. 1858.*
18 pp. 22$^{cm}$.

**1861.** Tides, currents, magnetic variation and geographic positions of light-houses. Chesapeake bay and its rivers. 1861. Prepared by Prof. Bache, assisted by Chas. A. Schott and L. F. Pourtales, assistants United States Coast survey.*
10 pp. 30$^{cm}$.

**1862.** Standard mean right ascensions of circumpolar and time stars, prepared for the use of the U. S. Coast survey. B. A. Gould. First edition. Washington: Government printing office. 1862.*
15 pp. 30$^{cm}$.

**1866.** Same. Ed. 2. 1866.*

**1874.** Report on the Nicaragua route for an interoceanic ship-canal, with a review of other proposed routes; made by Maximilian Von Sonnenstern to the Minister of public works of Nicaragua. Translated for the U. S. Coast survey. Washington: Government printing office. 1874.*
22 pp. 1 map. 29½$^{cm}$.

Field catalogue of 983 transit stars. Mean places for 1870.0. G. Davidson. Washington: Government printing office. 1874.*
33 pp. 23$^{cm}$.

The star-factors A, B, C for reducing transit-observations. 1874. G. Davidson. Washington: Government printing office. 1874.*
69 pp. 29½$^{cm}$.

On the air contained in sea water. By Oscar Jacobsen. Republished for the U. S. Coast survey from Annales de chemie et de physique, vol. 167. 1873 [1874].*
16 pp. 29$^{cm}$.

**1876.** On tides and tidal action in harbors. By J. E. Hilgard. Reprinted from Smithsonian report for 1874. Washington: Government printing office. 1876.*
22 pp. 23$^{cm}$.

Papers relating to metric standards distributed to the states of the union under a joint resolution of Congress of July 27, 1866. Washington: Government printing office. 1876.*
6 pp. 23$^{cm}$.
Signed by J. E. Hilgard, inspector of U. S. Standard weights and measures.

**1877.** Methods, discussions and results. Field work of the triangulation. R. D. Cutts. Washington: Government printing office. 1877.*
45 pp. 11 fig. 30$^{cm}$.
Reprinted with additions from the Coast survey report for 1868. See also Report for 1882.

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* Exhausted.

**1879.** Secular change of the magnetic declination in the United States and at some foreign stations. [By C. A. Schott.] Third edition, 1879.*
50 pp. 2 illus.
For other editions see Rept. 1855, app. 48.

**1880.** Deep sea sounding and dredging. A description and discussion of the methods and appliances used on board the Coast and geodetic survey steamer Blake. By Chas. D. Sigsbee, Lieut. Commander U. S. Navy, assistant in the U. S. C. S. Washington: Government printing office. 1880.*
221 pp. 8 fig., 35 pl., 16 diag. 29½$^{cm}$.

**1881.** General properties of the equations of steady motion. Thos. Craig. Washington: Government printing office. 1881.*
26 pp. 29$^{cm}$. (Treas. dept. doc. no. 71, C. & G. S.)

**1882.** A treatise on projections. By Thomas Craig. Part 1. Mathematical theory of projections. Part 2. Construction of projections. Washington: Government printing office. 1882.
xiv, 247 pp. 69 fig. 29½$^{cm}$. (Treas. dept. doc. no. 61, C. & G. S.)

Carlile P. Patterson. In memoriam. [1882?]*
12 pp. 25$^{cm}$.
Also published as app. 24, Rept. 1882.

**1883.** Original topographic and hydrographic sheets registered in the archives of the U. S. Coast and geodetic survey. Washington: Government printing office. 1883.*
70 pp. 30$^{cm}$.

Letter of the Superintendent on the proposed transfer to the Navy department. January 6, 1883.*
8 pp. 23$^{cm}$.

**1884.** Historical sketch of the U. S. Coast and geodetic survey. 1884.
8 pp. 23$^{cm}$.

Short descriptions of articles forming the Coast and geodetic survey exhibit at the Cotton centennial exposition, New Orleans, La., 1884–85. Compiled and arranged by C. O. Boutelle. Washington: Government printing office. 1884.*
25 pp. 1 fig. 23$^{cm}$.

**1886.** Logarithms of numbers, antilogarithms, etc. 1886.*
Cardboard leaf printed on both sides.

**1887.** Historical compilation. U. S. Coast and geodetic survey. [1887?]*
16 pp. 23$^{cm}$.

**1888.** Short descriptions of articles forming the Coast and geodetic survey exhibit at the Centennial exposition of the Ohio valley and central states, Cincinnati, Ohio, 1888. Compiled and arranged by C. O. Boutelle, assistant. Washington. R. O. Polkinhorn, printer, 1888.*
44 pp. 4 maps. 23$^{cm}$.

**1893.** [The methods and results of the U. S. Coast and geodetic survey. Leaflets printed for distribution at the World's columbian exposition, Chicago, Ill. 1893.]
Issued separately. 18$^{cm}$.
- The U. S. Coast and geodetic survey. [By T. C. Mendenhall.] 4 pp.
- Base apparatus. [By R. S. Woodward.] 4 pp.
- Triangulation and reconnaissance. [By W. C. Hodgkins.] 4 pp.
- Time, latitude, and longitude. [By C. H. Sinclair.] 4 pp.
- Gravity. [By E. D. Preston.] 4 pp.
- Magnetics. [By C. A. Schott.] 4 pp.
- Topography. [By H. C. Whiting.] 4 pp.
- Hydrography. [By Lieut. Com. S. M. Ackley, U. S. N.] 4 pp.
- Tides and currents. [By A. S. Christie and E. E. Haskell.] 4 pp.
- Hypsometry. [By Andrew Braid.] 4 pp.
- Chart publications. [By H. G. Ogden.] 4 pp.
- Weights and measures. [By O. H. Tittmann.] 4 pp.
- Model of United States and Alaska. [By D. B. Wainwright.] 4 pp.
- Description of the U. S. S. Blake and her deep sea apparatus. [By Lt. C. E. Vreeland, U. S. N.] 3 pp.

**1900.** Table of factors for computing differences in elevation (in feet). Table of corrections for curvature and refraction (in feet). Washington: Government printing office. 1900.
4 pp. 26½$^{cm}$.

Table showing the height in meters, corresponding to given angles of elevation and distances in meters. Washington: Government printing office. 1900.
4 pp. 26½$^{cm}$.

Table for converting customary and metric weights and measures. 1900.
4 pp. 26$^{cm}$.

Table of coefficients for reducing inclined sights on vertical rod to horizontal distance. Washington: Government printing office. 1900.
4 pp. 26$^{cm}$.

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*Exhausted.

**1901.** Methods and results of the U. S. Coast and geodetic survey [Leaflets printed for distribution at the Pan-American exposition, Buffalo, N. Y.] 1901.
Issued separately. $18^{cm}$.

First edition printed May 1, 1901. Spanish edition of same date included all except Weights and measures. Second English edition dated August 1, 1901.
The U. S. Coast and geodetic survey. 5 pp.
Chart publications. 4 pp.
Base apparatus. 5 pp. 1 pl.
Triangulation and reconnaissance. 4 pp. 1 pl.
Geodesy or measurement of the earth. 5 pp.
Gravity. 4 pp. 1 pl.
Tides and tidal currents. 4 pp.
Coast pilots. 4 pp.
Topography. 4 pp.
Magnetics. 4 pp. 1 map.
Hydrography. 4 pp. 1 pl.
Time, latitude and longitude. 4 pp.
Leveling. 4 pp. 1 pl.
Weights and measures. 5 pp.

**1902.** United States magnetic declination tables and isogonic charts for 1902 and principal facts relating to the earth's magnetism. By L. A. Bauer, chief of division of terrestrial magnetism. Washington: Government printing office. 1902.
405 pp. 29 fig., 3 pl. $30^{cm}$.

CONTENTS.—Early history of the compass; birth of the science of terrestrial magnetism; the earth, a great magnet; magnetic observatories; magnetic charts; magnetic surveys; the earth's magnetic poles and moment; determination of the true meridian; determination of the magnetic declination; the secular change of the magnetic declination in the United States and outlying territories; the magnetic declination in the United States and outlying territories for January 1, 1902; table of the most recent declinations observed in the United States and outlying territories, reduced to January 1, 1902; descriptions of magnetic stations occupied by the Coast and geodetic survey between 1881 and June 30, 1902.

# COAST PILOTS.

Coast Pilots were first begun as a series of publications in 1869. Previously to that coast pilot matters appeared from time to time in appendices to the annual reports. For a list of these appendices, see Coast Pilot in the catalogue.

The latest editions of the Coast Pilots are on sale at all of the chart agencies of the Survey, located in the principal cities on the coast. The Coast Pilots are now published under the following titles: United States Coast Pilot—Atlantic coast—Parts I–II to VIII, extending from Maine to Texas, inclusive. United States Coast Pilot—Pacific coast—California, Washington, and Oregon. United States Coast Pilot—Alaska—Part I.

Coast Pilot information relating to Bering Sea and the Arctic Ocean is also contained in Bulletin No. 40. Supplements to all the volumes are issued whenever new information makes it necessary, pending the revision of the volumes and the issue of a new edition. All volumes are corrected to date of issue by the Survey.

Pacific coast. Coast pilot of California, Oregon, and Washington territory. By George Davidson, assistant, Coast survey. 1869.*
262 pp. 33 illus. $30^{cm}$.

Pacific coast. Coast pilot of Alaska. (First part.) From southern boundary to Cook's inlet. By George Davidson, assistant, Coast survey. 1869.
251 pp. 8 illus. $30^{cm}$.

Coast pilot for the Atlantic sea-board. Gulf of Maine and its coast from Eastport to Boston. 1874. By J. S. Bradford, assistant. 1875.*
960 pp. 12 illus. $30^{cm}$.

Atlantic coast pilot. Boston bay to New York. 1878.
628 pp. 55 illus. $30^{cm}$.

Atlantic coast pilot. Boston bay to Monomoy. 1879.*
92 pp. 4 illus. $30^{cm}$.

Atlantic coast pilot. Nantucket and Vineyard sounds. 1879.*
107 pp. 7 illus. $30^{cm}$.

Atlantic coast pilot. Buzzard's and Narragansett bays. 1879.*
122 pp. 4 illus. $30^{cm}$.

Atlantic coast pilot. Block island and Fisher's island sounds, Gardiner's and Peconic bays. 1879.*
66 pp. 4 illus. $30^{cm}$.

Atlantic coast pilot. Long Island sound and East river. 1879.*
86 pp. 6 illus. $30^{cm}$.

Atlantic coast pilot. Harbors in Long Island sound. 1879.*
112 pp. 4 illus. $30^{cm}$.

Atlantic coast pilot. South coast of Long island, New York bay, and Hudson river. 1879.*
90 pp. 22 illus. $30^{cm}$.

The seven volumes above named, published early in the year 1879, comprise a series intended to meet local wants, and are all contained in the one volume of the Atlantic coast pilot for 1878, compiled and verified by J. S. Bradford, assistant.

Atlantic coast pilot. Division A. Eastport to Boston. (Second edition.) 1879.
694 pp. 56 illus. $30^{cm}$.

Atlantic local coast pilot. Subdivision 1. Passamaquoddy bay to Schoodic. 1879.*
115 pp. 10 illus. $30^{cm}$.

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* Exhausted.

Atlantic local coast pilot. Subdivision 2. Frenchmans bay to Isle-au-haut. 1879.*
196 pp. 7 illus. 30$^{cm}$.

Atlantic local coast pilot. Subdivision 3. Penobscot bay and tributaries. (First edition.) 1879.*
121 pp. 18 illus. 30$^{cm}$.

Atlantic local coast pilot. Subdivision 4. White Head island to Cape Small Point. 1879.*
126 pp. 6 illus. 30$^{cm}$.

Atlantic local coast pilot. Subdivision 5. Cape Small Point to Cape Ann. 1879.*
141 pp. 10 illus. 30$^{cm}$.

Atlantic local coast pilot. Subdivision 6. Cape Ann to Cohasset. 1879.*
107 pp. 5 illus. 30$^{cm}$.

The six volumes of the Atlantic local coast pilot named above and published about the middle of the year 1879, appear as separate parts of the large volume "Atlantic coast pilot, division A, Eastport to Boston" (second edition), compiled by J. S. Bradford, assistant.

Pacific coast pilot. Coast and islands of Alaska. Second series. Appendix 1. Meteorology and bibliography. By W. H. Dall, assistant. 1879.
375 pp. 27 illus. 30$^{cm}$.

Atlantic coast pilot. Division B. Boston to New York. (Second edition.) 1880.
675 pp. 53 illus. 30$^{cm}$.

Atlantic local coast pilot. Subdivision 7. Boston to Monomoy. (Second edition.) 1880.*
86 pp. 5 illus. 30$^{cm}$.

Atlantic local coast pilot. Subdivision 8. Nantucket and Vineyard sounds. (Second edition.) 1880.*
116 pp. 9 illus. 30$^{cm}$.

Atlantic local coast pilot. Subdivision 9. Buzzard's and Narragansett bays. (Second edition.) 1880*.
131 pp. 5 illus. 30$^{cm}$.

Atlantic local coast pilot. Subdivision 10. Block island and Fisher's island sounds; Gardiner's and Peconic bays. (Second edition.) 1880.*
70 pp. 5 illus. 30$^{cm}$.

Atlantic local coast pilot. Subdivision 11. Long Island sound and East river. (Second edition.) 1880.*
92 pp. 6 illus. 30$^{cm}$.

Atlantic local coast pilot. Subdivision 12. Harbors in Long Island sound. (Second edition.) 1880.
126 pp. 4 illus. 30$^{cm}$.

Atlantic local coast pilot. Subdivision 13. South coast of Long Island, New York bay, and Hudson river. (Second edition.) 1880.*
95 pp. 21 illus. 30$^{cm}$.

The volumes of the Atlantic local coast pilot numbered as subdivisions 7 to 13, inclusive, and enumerated as above, appear as separate parts of the large volume Atlantic coast pilot, division B, Boston to New York (second edition), and, like that volume, were compiled and prepared for publication by J. S. Bradford, assistant.

Atlantic local coast pilot. Subdivision 14. New York to Delaware entrance. (First edition). 1882.*
95 pp. 13 illus. 30$^{cm}$.

Atlantic local coast pilot. Subdivision 15. Delaware bay and tributaries. (First edition.) 1883*.
159 pp. 11 illus. 30$^{cm}$.

Pacific coast pilot. Alaska. Part I. Coast from Dixon entrance to Yakutat bay, with the inland passage. 1883.*
342 pp. 53 illus. 30$^{cm}$.

Atlantic local coast pilot. Subdivision 19. Cape Henry to Winyah bay, and inside passages. (First edition.) 1885.*
89 pp. 21 illus. 30$^{cm}$.

Atlantic local coast pilot. Subdivision 20. Winyah bay to Savannah, with the inland passage to Fernandina. (First edition.) 1885.*
86 pp. 17 illus. 30$^{cm}$.

Atlantic local coast pilot. Subdivision 13. South coast of Long Island, New York bay, and Hudson river. (Third edition.) 1886.*
99 pp. 8 illus. 30$^{cm}$.

Atlantic local coast pilot. Subdivision 21. Tybee roads to Jupiter inlet. (First edition.) 1887.*
106 pp. 11 illus. 30$^{cm}$.

Atlantic local coast pilot. Subdivision 6–7. Cape Ann to Monomoy. (Third edition.) 1888.
143 pp. 9 illus. 30$^{cm}$.

United States coast pilot. Atlantic coast. Part IV. Long Island sound, with approaches and adjacent waters. (First edition.) 1888.*
155 pp. 15 illus. 30$^{cm}$.

This volume takes the place of subdivisions 10, 11, and 12, Atlantic local coast pilot, and of pages 304–549 of division B, Atlantic coast pilot.

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* Exhausted.

United States coast pilot. Atlantic coast. Part VI. Chesapeake bay and tributaries. (First edition.) 1889.*
135 pp. 32 illus. 30cm.

Atlantic local coast pilot. Subdivision 22. Straits of Florida, Jupiter inlet to Dry Tortugas. (First edition.) 1889.*
95 pp. 2 illus. 30cm.

Pacific coast. Coast pilot of California, Oregon, and Washington. By George Davidson, assistant. (Fourth edition.) 1889.
721 pp. 457 illus. 30cm.

Pacific coast pilot. Alaska. Part I. Dixon entrance to Yakutat bay, with inland passage from the strait of Fuca to Dixon entrance. (Third edition.) 1891.
243 pp. 32 illus. 30cm.

United States coast pilot. Atlantic coast. Parts I—II. From the St. Croix river to Cape Ann. (First edition.) 1891.*
105, 96 pp. 18, 16 illus. 30cm.

United States coast pilot. Atlantic coast. Part IV. From Point Judith to New York. (Second edition.) 1892.*
156 pp. 13 illus. 30cm.

United States coast pilot. Atlantic coast. Part III. From Cape Ann to Point Judith. (First edition.) 1893.*
153 pp. 5 illus. 30cm.

Supplement to first edition. United States coast pilot. Atlantic coast. Part VI. Chesapeake bay and tributaries. 1894.*
8 pp. 30cm.

United States coast pilot. Atlantic coast. Part V. From New York to Chesapeake bay entrance. (First edition.) 1895.*
120 pp. 6 illus. 30cm.

United States coast pilot. Atlantic coast. Part VII. From Chesapeake bay entrance to Key West. (First edition.) 1895.*
157 pp. 7 illus. 30cm.

Supplement to first edition. United States coast pilot. Atlantic coast. Part V. From New York to Chesapeake bay entrance. 1895.*
9 pp. 30cm.

Supplement to second edition. United States coast pilot. Atlantic coast. Part IV. From Point Judith to New York. 1895.*
14 pp. 30cm.

Supplement to first edition. United States coast pilot. Atlantic coast. Part III. From Cape Ann to Point Judith. 1895.*
11 pp. 30cm.

Supplement to the first edition. United States coast pilot. Atlantic coast. Parts I and II. From the St. Croix river to Cape Ann. 1895.*
11 pp. 30cm.

Supplement to United States coast pilot. Atlantic coast. Part I-II, III, IV, V, VI, VII. Rules of the road at sea and in harbors, rivers, and inland waters (except the Great Lakes and their tributary waters as far east as Montreal). 1895.*
14 pp. 30cm.

Supplement to United States coast pilot. Atlantic coast. Parts I-II, III, IV, V, VI, VII. Rules of the road at sea and in harbors, rivers, and inland waters (except the Great Lakes and their connecting and tributary waters, as far east as Montreal). 1896.*
16 pp. 30cm.

Supplement to first edition. United States coast pilot. Atlantic coast. Part V. From New York to Chesapeake Bay entrance. 1897.*
16 pp. 30cm.

Supplement to second edition. United States coast pilot. Atlantic coast. Part IV. From Point Judith to New York. 1897.*
21 pp 30cm.

United States coast pilot. Atlantic coast. Part VIII. Gulf of Mexico, from Key West to the Rio Grande. (First edition.) 1897.*
143 pp. 5 illus. 30cm.

Supplement to first edition. United States coast pilot. Atlantic coast. Part VI. Chesapeake bay and tributaries. 1897.*
22 pp. 30cm.

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* Exhausted.

Supplement to United States coast pilot. Atlantic coast. Parts I-II, III, IV, V, VI, VII, VIII. Rules of the road at sea and in harbors, rivers, and inland waters (except the Great Lakes and their connecting and tributary waters as far east as Montreal, and the Red River of the North and rivers emptying into the Gulf of Mexico and their tributaries). 1897.*
20 pp. 30cm.

Supplement to first edition. United States coast pilot. Atlantic coast. Part VII. From Chesapeake bay entrance to Key West. 1897.*
19 pp. 30cm.

Supplement to first edition. United States coast pilot. Atlantic coast. Part V. From New York to Chesapeake bay entrance. 1897.*
16 pp. 30cm.

Supplement to first edition. United States coast pilot. Atlantic coast. Parts I-II. From the St. Croix river to Cape Ann. 1897.*
34 pp. 30cm.

Supplement to first edition. United States coast pilot. Atlantic coast. Part III. From Cape Ann to Point Judith. 1897.*
20 pp. 30cm.

Supplement to second edition. United States coast pilot. Atlantic coast. Part IV. From Point Judith to New York. 1897.*
31 pp. 30cm.

Supplement to first edition. United States coast pilot. Atlantic coast. Part VII. From Chesapeake bay entrance to Key West. 1898.*
20 pp. 30cm.

United States coast pilot. Atlantic coast. Part V. From New York to Chesapeake bay entrance. (Second edition.) 1898.*
129 pp. 4 illus. 30cm.

Supplement to third edition. Pacific coast pilot. Alaska. Part I. Dixon entrance to Yakutat bay, with inland passage from Strait of Fuca to Dixon entrance. 1898.*
37 pp. 30cm.

Supplement to United States coast pilot. Atlantic coast. Parts I-II, III, IV, V, VI, VII, VIII. Rules of the road at sea and in harbors, rivers, and inland waters (except the Great Lakes and their connecting and tributary waters as far east as Montreal, and the Red River of the North and rivers emptying into the Gulf of Mexico and their tributaries). 1898.*
20 pp. 30cm.
Reprint of 1897 edition.

Supplement to first edition. United States coast pilot. Atlantic coast. Part VI. Chesapeake bay and tributaries. 1898.*
23 pp. 30cm.

Supplement to first edition. United States coast pilot. Atlantic coast. Part VIII. Gulf of Mexico, from Key West to the Rio Grande. 1899.*
23 pp. 30cm.

Supplement to first edition. United States coast pilot. Atlantic coast. Part VI. Chesapeake bay and tributaries. 1899.*
21 pp. 30cm.

Supplement to first edition. United States coast pilot. Atlantic coast. Part I-II. From the St. Croix river to Cape Ann. 1899.*
26 pp. 30cm.

Supplement to first edition. United States coast pilot. Atlantic coast. Part III. From Cape Ann to Point Judith. 1899.*
18 pp. 30cm.

Supplement to first edition. United States coast pilot. Atlantic coast. Part VIII. Gulf of Mexico, from Key West to the Rio Grande. 1899.*
18 pp. 30cm.

United States coast pilot. Atlantic coast. Part IV. From Point Judith to New York. (Third edition.) 1899.
187 pp. 30cm.

Supplement to first edition. United States coast pilot. Atlantic coast. Part VI. Chesapeake bay and tributaries. 1900.*
24 pp. 30cm.

Supplement to first edition. United States coast pilot. Atlantic coast. Parts I-II. From the St. Croix river to Cape Ann. 1900.
27 pp. 30cm.

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* Exhausted.

Supplement to United States coast pilot. Atlantic coast. Parts I–II, III, VI, VIII. Rules of the road at sea, and in harbors, rivers, and inland waters (except the Great lakes and their connecting and tributary waters as far east as Montreal, and the Red river of the north and rivers emptying into the Gulf of Mexico and their tributaries). 1900.
20 pp. $30^{cm}$.

Reprint of 1897 edition. Also printed as an appendix to Parts IV, V, and VII.

United States coast pilot. Atlantic coast. Part VII. From Chesapeake bay entrance to Key West. (Second edition.) 1900.
189 pp. 6 illus. $30^{cm}$.

United States coast pilot. Atlantic coast. Part V. From New York to Chesapeake bay entrance. Second edition (reprint with supplement). 1901.
129 pp. 4 illus. $30^{cm}$.

Supplement to the reprint of second edition. United States coast pilot. Atlantic coast. Part V. From New York to Chesapeake bay entrance. 1901.
13 pp. $30^{cm}$.

United States coast pilot. Atlantic coast. Part VIII. Gulf of Mexico, from Key West to the Rio Grande. (Second edition.) 1901.
167 pp. 4 illus. $30^{cm}$.

United States coast pilot. Pacific coast. Alaska. Part I. Dixon entrance to Yakutat bay, with inland passage from Juan de Fuca strait to Dixon entrance. 1901.
246 pp. 14 illus. $30^{cm}$.

United States coast pilot. Atlantic coast. Part VI. Chesapeake bay and tributaries. 1902.
160, 8 pp. 1 illus. $30^{cm}$.

Supplement to United States coast pilot. Atlantic coast. Part VII. From Chesapeake bay entrance to Key West. 1902.
15 pp. $30^{cm}$.

Philippine islands. Sailing directions for the north and west coasts of Luzon, from Cape Engane to Manila Bay. Bulletin compiled at the Coast and geodetic survey suboffice, Manila, P. I., from various sources of information. Manila, Bureau of public printing, 1902.
36 pp. $23^{cm}$.

# NOTICE TO MARINERS.

The annual reports of the Survey previous to 1869 contained many Notices to Mariners in the form of communications from the Superintendent to the Secretary of the Treasury, with requests that authority be given to publish for the benefit of mariners. The separate publications of these notices since 1869 are for general distribution upon request, and are supplementary to the publications formerly made, and still continued, in the leading commercial and nautical journals. For general lists of discoveries and developments, see the Reports from 1850 to 1864, inclusive.

Pacific coast. Shoal off Cape Reyes, California. 1 p. July 12, 1869.*

Atlantic coast. East coast of Florida. St. Lucie shoal. 1 p. Jan. 22, 1872.*

Northwest coast of America. Aleutian islands. 1 p. June 20, 1874.*

Atlantic coast. Long Island sound. 1 p. Oct. 10, 1874.*

1. Atlantic coast. Sailing directions for St. Augustine harbor. 1 p. Jan. 14, 1875.*
2. Pacific coast. Sailing directions for Macks shelter, Oregon. 1 p. Jan. 26, 1875.*
3. Pacific coast. Sunken rock off the boundary of California and Oregon. 1 p. Feb. 10, 1875.*
4. Pacific coast. Additional peaks, Noonday rock, entrance to San Francisco bay, California. 1 p. May 4, 1875.*
5. Pacific coast. Sunken rock off Cape Mendocino, California. 1 p. May 7, 1875.
6. Pacific coast. Sunken rocks. San Luis Obispo bay, California. 1 p. May 20, 1875.*
7. Pacific coast. Shoal near South Farallon. 1 p. July 24, 1875.
8. Pacific coast. Dangerous shoal in the northern approach to San Miguel passage. 1 p. Sept. 4, 1875.
9. Atlantic coast. Approaches to Chesapeake bay. Wreck 12 miles to the southward and eastward of Cape Henry. 1 p. Sept. 20, 1875.*
10. Atlantic coast. Ledge in Delaware river. 1 p. 1 map. Nov. 4, 1875.*
11. Gulf of Mexico. Positions of wrecks at the entrance of Pensacola bay, Florida. 1 p. 1 map. Feb. 8, 1876.*
12. Atlantic coast. Chesapeake bay. Wreck off New Point Comfort, Virginia. 1 p. May 16, 1877.*
13. Atlantic coast. Wreck off Currituck beach, North Carolina. 1 p. Dec. 15, 1877.*
14. Gulf of Mexico. Observations upon northers and southeast gales. 2 pp. Dec. 21, 1877.
15. Gulf of Maine. Tidal currents at entrance. Mar. 7, 1878.

    Same. Second edition. 4 pp. June 15, 1878.
16. Atlantic coast. Florida reefs. Disappearance of a beacon. 1 p. May 9, 1878.*
17. Atlantic coast. Nantucket sound. Wreck in Hyannis harbor. 1 p. July 16, 1878.*
18. Pacific coast. Depth of water over the bar at entrance of Wilmington harbor, California. 1 p. June 27, 1879.
19. Coast of Alaska. Location of Keen rock in the middle passage to Sitka harbor, Alaska. 1 p. June 27, 1879.
20. Atlantic coast. Closing of New Inlet, mouth of Cape Fear river, North Carolina. 1 p. June 27, 1879.
21. Atlantic coast. Increased depth of water at entrance to Cape Fear river, North Carolina. 1 p. July 9, 1879.*
22. Atlantic coast. Sunken wreck in the track of vessels running along the New Jersey coast. 1 p. July 14, 1879.*

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* Exhausted.

23. Atlantic coast. Development of Johnsons rock, Casco bay, Maine. 1 p. July 25, 1879.
24. Atlantic coast. Dangerous rock near Isle of Wight shoal, coast of Maryland. 1 p. Oct. 14, 1879.
25. Atlantic coast. Development of Schuylers ledge, off Sakonnet point, Rhode Island. 1 p. Nov. 15, 1879.*
26. Pacific coast. Development of dangerous rocks near Fort Ross, California. 1 p. June 7, 1880.
27. Atlantic coast. Sunken wreck in entrance to Rappahannock river, Virginia. 1 p. Dec. 16, 1880.
28. Atlantic coast. Improvements of rivers and harbors on the coasts of Maine and Massachusetts, under the direction of Gen. George Thom, Engineer corps, U. S. Army. 2 pp. Apr. 26, 1881.*
29. Atlantic coast. Connecticut. Breakwater in process of construction to the westward of Bartletts reef, Fishers Island sound. 1 p. Apr. 27, 1881.*
30. Atlantic coast. Sunken wreck off the east coast of Florida. 1 p. June 1, 1881.
31. Pacific coast. Reported dangers in the approaches to St. Paul harbor, Kadiak island, Alaska. 1 p. June 1, 1881.
32. Atlantic coast. New shoal. Frying-Pan shoals, off Cape Fear, North Carolina. 1 p. July 20, 1881.
33. Atlantic coast. Development of Fiske rock, Narragansett bay, Rhode Island. 1 p. Nov. 10, 1881.
34. Atlantic coast. Dangerous rock in eastern entrance to Fishers Island sound. 1 p. Aug. 24, 1882.

The greater number of the above-named Notices are printed somewhat as handbills, in large type for easy reading, and occupy about one page quarto.

35. Atlantic coast. Dangerous rocks in western part of Fishers Island sound. Approaches to New London and Mystic harbors. 1 p. 1 map. Jan. 14, 1883.*
36. Atlantic coast. Sunken wreck in the track of vessels along the New Jersey coast. 1 p. May 14, 1883.
37. Atlantic coast. Wreck in the track of vessels along the east coast of Florida. 1 p. June 8, 1883.
38. Pacific coast. Discovery of a rock in Surge (or southern) narrows, Peril strait, southeast Alaska. 1 p. June 19, 1883.
39. Atlantic coast. Wreck in the track of coasting vessels off New Jersey. 1 p. June 22, 1883.
40. Atlantic coast. Dangerous rock off Warrens point, Rhode Island. 1 p. Oct. 31, 1883.
41. Atlantic coast. Dangerous rocks recently reported on the coast of Maine, near Muscongus and Booth bays. Wreck off Tarpaulin cove, Vineyard sound. 1 p. Nov. 9, 1883.
42. Atlantic coast. Rock reported in Eggemoggin reach, Maine. Rocks in East river, New York, near North Brother and Rikers islands. 1 p. Nov. 13, 1883.
43. Atlantic coast. Dangerous shoals off Cape Henlopen, Delaware. 1 p. Nov. 26, 1883.
44. Atlantic coast. Wreck in Potomac river, near Blackistone island. 1 p. Dec. 8, 1883.
45. Atlantic coast. Dangerous shoals in Monomoy passage. 1 p. Mar. 20, 1884.
46. Pacific coast. Notes on dangers in Neva and Peril straits and anchorages in Fish bay, southeast Alaska. 2 pp. May 27, 1884.
47. Atlantic coast. Dangerous ledges in Fishers island sound. 1 p. May 28, 1884.
48. Atlantic coast. Dangerous rock in East river, New York. 1 p. May 31, 1884.
49. Atlantic coast. Dangerous ledge in Englishmans bay, coast of Maine. 1 p. June 1, 1884.
50. Atlantic coast. Development of ledges off Minots ledge lighthouse, Massachusetts bay. 1 p. June 10, 1884.
51. Atlantic coast. Important changes at and near Cape Henlopen. 1 p. June 30, 1884.
52. Atlantic coast. Dangerous rock in East river, New York. 1 p. Aug. 11, 1884.
53. Changes in the pilotage laws of the port of New York. 1 p. Sept. 15, 1884.
54. Atlantic coast. Rocks recently reported on the coast of New England. 1 p. Oct. 7, 1884.
55. Atlantic coast. I. Dangerous ledges developed in the resurvey of Long Island sound. II. Ledge near Seal rock, Rhode Island. 1 p. Nov. 1, 1884.
56. Atlantic coast. Shoal developed in Vineyard sound. 1 p. Nov. 15, 1884.
57. Pacific coast. Discovery of a rock in Security bay, Kuiu island, Chatham strait, Alaska. 1 p. Nov. 15, 1884.*

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* Exhausted.

58. Atlantic coast. I. Development of shoals in Narragansett bay, Rhode Island, and Block island sound. II. Development of Sabine bank, off Sabine pass, Gulf of Mexico. 1 p. Feb. 10, 1885.

59. Atlantic coast. Changes in main ship channel, Vineyard sound. 1 p. Mar. 23, 1885.

60. Pacific coast. Sailing directions for Wrangell strait, Alaska. 2 pp. Mar. 23, 1885.

61. Pacific coast. Sailing directions for inland passage between Sitka harbor and Hooniah sound, through Olga strait, Neva strait, and Peril strait, Alaska. 4 pp. June 12, 1885.

62. Gulf of Mexico. Shoal developed near Marquesas keys, Florida. 1 p. July 1, 1885.

63. Atlantic coast. Ledges developed in the resurvey of Long Island sound. 1 p. Aug. 24, 1885.

64. Atlantic coast. Dangerous rock developed in the resurvey of East river, New York. 1 p. Oct. 6, 1885.

65. Atlantic coast. Dangers developed in the resurvey of East river, New York. 1 p. Oct. 12, 1885.

66. Atlantic coast. Development of bar between Thatchers island and Milk island, Massachusetts. 1 p. Oct. 21, 1885.

67. Atlantic coast. Ledge developed in Boston bay, Massachusetts. 1 p. Oct. 21, 1885.

68. Atlantic coast. Dangers developed in the resurvey of East river, New York. 1 p. Nov. 20, 1885.

69. Atlantic coast. Important changes in Monomoy passage, Massachusetts. 1 p. Nov. 20, 1885.

70. Atlantic coast. Ledge developed in Fishers island sound, Connecticut. 1 p. Nov. 30, 1885.

71. Atlantic coast. Examination of dangers reported on the coast of Maine. 1 p. Dec. 7, 1885.

72. Coast of the United States. Chart corrections during the quarter ending March 31, 1886. 4 pp. Mar. 31, 1886.

This was the first number of the quarterly series of these notices, the publication of which was recommended by the hydrographic inspector.

73. Dangerous wreck on Charleston bar. 1 p. May 12, 1886.

74. Atlantic coast. Dangerous wreck on Charleston bar. (Addition to Notice to mariners, no. 73.) 1 p. May 21, 1886.

75. Atlantic coast. Danger developed in the resurvey of East river, New York. 1 p. May 31, 1886.

76. Coast of the United States. Chart corrections during the quarter ending June 30, 1886. 4 pp. June 30, 1886.*

77. Coast of the United States. Chart corrections during the quarter ending September 30, 1886. 4 pp. Sept. 30, 1886.

78. Atlantic coast. Velocity and direction of the Gulf stream between Fowey rocks, Florida, and Gun Cay, Bahamas. 1 p. Oct. 13, 1886.

79. Atlantic coast. Development of shoals off False cape, Virginia. 1 p. Oct. 15, 1886.

80. Atlantic coast. Ledges developed in the resurvey of Long Island sound. 1 p. Oct. 23, 1886.

81. Coast of the United States. Correction of an error in Notice to mariners, no. 77. 1 p. Nov. 8, 1886.

82. Atlantic coast. Ledge developed in East river, New York. 1 p. Dec. 1, 1886.

83. Coast of the United States. Chart corrections during the quarter ending December 31, 1886. 4 pp. Dec. 31, 1886.

84. Atlantic coast. Obstruction to navigation in the Gulf stream. 1 p. Jan. 8, 1887.*

85. Coast of the United States. Chart corrections during the quarter ending March 31, 1887. 5 pp. Mar. 31, 1887.

86. Atlantic coast. Dangerous sunken wreck in Long Island sound. 1 p. Apr. 16, 1887.

87. Atlantic coast. Shoal spot on rocky ledge off Eatons point, Long Island sound, New York. 1 p. June 9, 1887.

88. Coast of the United States. Chart corrections during the quarter ending June 30, 1887. 6 pp. June 30, 1887.

89. Coast of the United States. Chart corrections during the month of July, 1887. 2 pp. July 30, 1887.

With this number was begun the monthly series of these notices, as follows. They average three or four pages each.

90–92. Coast of the United States. Chart corrections for the months from August to October, 1887. 1887.

93. Atlantic coast. Dangerous rock in Vineyard sound, Massachusetts. Nov. 8, 1887.

94. Coast of the United States. Gulf stream currents. Nov. 22, 1887.

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* Exhausted.

95, 96. Coast of the United States. Chart corrections for the months of November and December, 1887. 1887.

‡Index to nos. 1 to 96.]

97. Coast of the United States. Coast currents approaching Sandy Hook. Jan. 9, 1888.

98. Coast of the United States. Chart corrections for the months from January to December, 1888. 1888.

‡Index to nos. 97 to 109. (1888.)

‡Index to chart corrections. January 1 to December 31, 1888.

110–113. Coast of the United States. Chart corrections for the months from January to April, 1889. 1889.

114. Atlantic coast. Off-shore current observations. Information of special importance to mariners. May 1, 1889.

115–117. Coast of the United States. Chart corrections for the months from May to July, 1889. 1889.

118. Information concerning U. S. Coast and geodetic survey charts. Aug. 15, 1889.

119–123. Chart corrections for the months from August to December, 1889. 1889.

Nos. 119–204 (inclusive except indexes) bear subtitle "Coast of the United States."

‡Index to chart corrections, 1889. January 1 to December 31.

124–135. Chart corrections for the months from January to December, 1890. 1890.

136. Index to chart corrections. January 1 to December 31, 1890. Dec. 31, 1890.

137–148. Chart corrections for the months from January to December, 1891. 1891.

149. Index to chart corrections January 1 to December 31, 1891. Dec. 31, 1891.

150–161. Chart corrections for the months from January to December, 1892. 1892.

162. Index to chart corrections January 1 to December 31, 1892. Dec. 31, 1892.

163–174. Chart corrections for the months from January to December, 1893. 1893.

175. Index to chart corrections January 1 to December 31, 1893. Dec. 31, 1893.

176–187. Chart corrections for the months from January to December, 1894. 1894.

188. Index to chart corrections January 1 to December 31, 1894. Dec. 31, 1894.

189–200. Chart corrections for the months from January to December, 1895. 1895.

201. Index to 1895. Chart corrections January 1 to December 31, 1895. Dec. 31, 1895.

202. Coast of the United States. Tidal indicator in Delaware river, Delaware. Jan. 27, 1896.

203–214. Coast of the United States and adjacent territories. Chart corrections for the months from January to December, 1896. 1896.

Nos. 205–280 (inclusive except indexes) bear subtitle "Coast of the United States and adjacent territories."

‡Index to 1896. Chart corrections January 1 to December 31, 1896. Jan., 1897.

215–226. Chart corrections for the months from January to December, 1897. 1897.

227. Index to 1897. Chart corrections January 1 to December 31, 1897. Jan., 1898.

228–239. Chart corrections for the months from January to December, inclusive, 1898. 1898.

240. Index to 1898. Chart corrections for the months January to December, inclusive, 1898. Jan., 1899.

241–252. Chart corrections for the months from January to December, 1899. 1899.

253. Index to 1899. Chart corrections January 1 to December 31, 1899. Jan., 1900.

254–265. Chart corrections for the months from January to December, 1900. 1900.

266. Index to 1900. Chart corrections January 1 to December 31, 1900. Jan., 1901.

267. Information affecting sailing directions for Delaware river. Jan. 16, 1901.

268–279. Chart corrections for the months from January to December, 1901. 1901.

280. Index to 1901. Chart corrections January 1 to December 31, 1901. Jan., 1902.

281–293. Coast of the United States, adjacent territories, and islands under the jurisdiction of the United States. Chart corrections January 1 to December 31, 1902.

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‡No number assigned.

## PHILIPPINE ISLANDS.—NOTICE TO MARINERS.

[Seal of the Survey.] Treasury department. Philippine islands. Notice to mariners, advance publication, U. S. Coast and geodetic survey suboffice, Manila, P. I.

Printed on one side of the leaf. 24 cm.
A suboffice of the Survey was established in December, 1900, where information useful to mariners could be prepared and published. The following series of notices was promulgated to give prompt announcement of discoveries, etc., affecting Philippine charts. Copies are furnished mariners free of charge on application to the suboffice, room 16, Intendencia building (P. O. box 600), Manila.
Advance publication in the title above is omitted on no. 7, 1901, and subsequent issues.

### 1901.

1. [Sailing directions, etc.] pp. 1-3. Mar. 1.
2. [Sailing directions, etc.] pp. 4-7. Apr. 1.
3. [Sailing directions, etc.] pp. 8-12. July 1.
4. [Sailing directions, etc.] pp. 13-18. Aug. 1.
5. [Sailing directions, etc.] pp. 20-23. Sept. 16.
6. [Sailing directions, etc.] pp. 25-28. Oct. 5.
7. [Sailing directions, etc.] pp. 30-38. Nov. 8.
   Sketch of South Bais bay, Negros.
8. [Sailing directions, etc.] pp. 40-53. Dec. 24.
   Sketch of Maasin, Leyte.

### 1902.

1. [Sailing directions, etc.] pp. 1-6. Jan. 20.
   Sketch III, Halsey harbor, Culion.
2. [Sailing directions, etc.] pp. 7-10. Feb. 19.
   Sketch IV, Bogo bay, Cebu.
3. [Sailing directions, etc.] pp. 11-15. Mar. 1.
4. [Sailing directions, etc.] pp. 16-19. Apr. 9.
5. [Sailing directions, etc.] pp. 20-22. May 12.
6. [Sailing directions, etc.] pp. 23-27. June 26.
7. [Sailing directions, etc.] pp. 29-31. July 26.
8. [Sailing directions, etc.] pp. 32-34. Aug. 26.

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# TIDE TABLES.

Like many other publications of the Survey the Tide Tables were first issued as appendices to the reports. They were issued as an independent series in 1866. In that year the Tables were divided and issued separately for the Atlantic and Pacific coasts of the United States. In 1895 the Tables for the two coasts were combined into one volume from which was reprinted an edition for the Pacific coast, and, in 1901, a similar edition for the Atlantic coast. At present the Tide Tables also contain predictions for the principal foreign ports.

Tide tables for the United States [for the year 1854].
Rept. 1853, app. 26,* pp. 67–70.

Tide tables for the coast of the United States [for the year 1855].
Rept. 1854, app. 51,* pp. 180–189.

Tide tables for the use of navigators [for the year 1856], prepared from the Coast survey observations, by A. D. Bache, superintendent. (Prepared by authority of the Treasury department for E. and G. W. Blunt, New York.)
Rept. 1855, app. 53,* pp. 347–359.

Tide tables for the use of navigators [for the year 1857], prepared from the Coast survey observations, by A. D. Bache, superintendent.
Rept. 1856, app. 17,* pp. 120–133.

Tide tables for the use of navigators [for the year 1858], prepared from the Coast survey observations, by A. D. Bache, superintendent. (Furnished by authority of the Treasury department to E. and G. W. Blunt, New York, and revised Jan. 1857.)
Rept. 1857, app. 20,* pp. 157–184.

Tide tables for the use of navigators [for the year 1859], prepared from the Coast survey observations, by A. D. Bache, superintendent. (Furnished by authority of the Treasury department to E. and G. W. Blunt, New York, and revised October, 1858.)
Rept. 1858, app. 43,* pp. 275–297.

Tide tables for the use of navigators [for the year 1860], prepared from the Coast survey observations, by A. D. Bache, superintendent. (Furnished by authority of the Treasury department to E. and G. W. Blunt, New York, and revised October, 1859.)
Rept. 1859, app. 14,* pp. 136–167.

Tide tables for the use of navigators [for the year 1861], prepared from the Coast survey observations, by A. D. Bache, superintendent. (Furnished by authority of the Treasury department to E. and G. W. Blunt, New York, and revised October, 1860.)
Rept. 1860, app. 16,* pp. 131–164.

Tide tables for the use of navigators [for the year 1862], prepared from the Coast survey observations, by A. D. Bache, superintendent. (Furnished by authority of the Treasury department to E. and G. W. Blunt, New York, and revised May, 1861.)
Rept. 1861, app. 9,* pp. 98–131.

Tide tables for mariners [for the year 1863], prepared from the Coast survey observations, by A. D. Bache, superintendent. (Furnished by authority of the Treasury department to E. and G. W. Blunt, New York, and revised October, 1862.)
Rept. 1862, app. 8,* pp. 93–126.

Tide tables for the use of navigators [for the year 1864], prepared from the Coast survey observations, by A. D. Bache, superintendent. (Furnished by authority of the Treasury department to E. and G. W. Blunt, New York, and revised 1863.)
Rept. 1863, app. 12,* pp. 84–117.

Tide tables for the use of navigators [for the year 1865], prepared from the Coast survey observations, by A. D. Bache, superintendent. (Furnished by authority of the Treasury department to E. and G. W. Blunt, New York, and revised 1864.)
Rept. 1864, app. 8,* pp. 58–90.

[Tide tables for 1866 were not printed. All of the tables succeeding this date were printed at the Government printing office in each case during the year preceding the year from which the tables were predicted.]

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* Exhausted.

Tide tables for the Atlantic coast of the United States for the year 1867.* [A. D. Bache, superintendent.]
101 pp. 18$^{cm}$.
**Preface and specimen table is also printed as app. 7, Rept. 1866.**

Tide tables for the Pacific coast of the United States for the year 1867.* [1866.]
32 pp. 18$^{cm}$.

Tide tables for the Atlantic coast of the United States for the year 1868. [Benjamin Peirce, superintendent.]
109 pp. 18$^{cm}$.

Tide tables for the Pacific coast of the United States for the year 1868.
58 pp. 18$^{cm}$.

Tide tables for the Atlantic coast of the United States for the year 1869.*
110 pp. 18$^{cm}$.

Tide tables for the Pacific coast of the United States for the year 1869.
58 pp. 18$^{cm}$.

Tide tables for the Atlantic coast of the United States for the year 1870.*
111 pp. 18$^{cm}$.

Tide tables for the Pacific coast of the United States for the year 1870.
59 pp. 18$^{cm}$.

Tide tables for the Atlantic coast of the United States for the year 1871.
112 pp. 18$^{cm}$.

Tide tables for the Pacific coast of the United States for the year 1871.
59 pp. 18$^{cm}$.

Tide tables for the Atlantic coast of the United States for the year 1872.
119 pp. 18$^{cm}$.

Tide tables for the Pacific coast of the United States for the year 1872.
59 pp. 18$^{cm}$.

Tide tables for the Atlantic coast of the United States for the year 1873.
121 pp. 18$^{cm}$.

Tide tables for the Pacific coast of the United States for the year 1873.
60 pp. 18$^{cm}$.

Tide tables for the Atlantic coast of the United States for the year 1874.
122 pp. 18$^{cm}$.

Tide tables for the Pacific coast of the United States for the year 1874.
60 pp. 18$^{cm}$.

Tide tables for the Atlantic coast of the United States for the year 1875. [C. P. Patterson, superintendent.]
122 pp. 18$^{cm}$.

Tide tables for the Pacific coast of the United States for the year 1875.
61 pp. 18$^{cm}$.

Tide tables for the Atlantic coast of the United States for the year 1876.
109 pp. 18$^{cm}$.

Tide tables for the Pacific coast of the United States for the year 1876.
61 pp. 18$^{cm}$.

Tide tables for the Atlantic coast of the United States for the year 1877.
124 pp. 18$^{cm}$.

Tide tables for the Pacific coast of the United States for the year 1877.
61 pp. 18$^{cm}$.

Tide tables for the Atlantic coast of the United States for the year 1878.
124 pp. 18$^{cm}$.

Tide tables for the Pacific coast of the United States for the year 1878.
61 pp. 18$^{cm}$.

Tide tables for the Atlantic coast of the United States for the year 1879.
128 pp. 18$^{cm}$.

Tide tables for the Pacific coast of the United States for the year 1879.
65 pp. 18$^{cm}$.

Tide tables for the Atlantic coast of the United States for the year 1880.
129 pp. 18$^{cm}$.

Tide tables for the Pacific coast of the United States for the year 1880.
65 pp. 18$^{cm}$.

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* Exhausted.

Tide tables for the Atlantic coast of the United States for the year 1881.
129 pp. $18^{cm}$.

Tide tables for the Pacific coast of the United States for the year 1881.
65 pp. $18^{cm}$.

Tide tables for the Atlantic coast of the United States for the year 1882. [J. E. Hilgard, superintendent.]
130 pp. $18^{cm}$.

Tide tables for the Pacific coast of the United States for the year 1882.
65 pp. $18^{cm}$.

Tide tables for the Atlantic coast of the United States for the year 1883.
130 pp. $18^{cm}$.

Tide tables for the Pacific coast of the United States for the year 1883.
66 pp. $18^{cm}$.

Tide tables for the Atlantic coast of the United States for the year 1884.
136 pp. $18^{cm}$.

Tide tables for the Pacific coast of the United States for the year 1884.
66 pp. $18^{cm}$.

Tide tables for the Atlantic coast of the United States for the year 1885.
136 pp. $18^{cm}$.

Tide tables for the Pacific coast of the United States for the year 1885.
66 pp. $18^{cm}$.

Tide tables for the Atlantic coast of the United States for the year 1886. [F. M. Thorn, superintendent.]
157 pp. $18^{cm}$. (Treas. dept. doc. 716.)

Tide tables for the Pacific coast of the United States, together with a few stations in Lower California, British Columbia, and Alaska territory, for the year 1886.
75 pp. $18^{cm}$. (Treas. dept. doc. 840.)

Tide tables for the Atlantic coast of the United States for the year 1887.
241 pp. $18^{cm}$. (Treas. dept. doc. 848.)

Tide tables for the Pacific coast of the United States, together with a few stations in Lower California, British Columbia, and Alaska territory, for the year 1887.
75 pp. $18^{cm}$. (Treas. dept. doc. 711.)

Tide tables for the Atlantic coast of the United States for the year 1888.
242 pp. $18^{cm}$. (Treas. dept. doc. 995.)

Tide tables for the Pacific coast of the United States, together with a few stations in Lower California, British Columbia, and Alaska territory, for the year 1888.
80 pp. $18^{cm}$. (Treas dept. doc. 1009.)

Tide tables for the Atlantic coast of the United States for the year 1889.
242 pp. $18^{cm}$. (Treas. dept. doc. 1081.)

Tide tables for the Pacific coast of the United States, together with a few stations in Lower California, British Columbia, and Alaska territory, for the year 1889.
79 pp. $18^{cm}$. (Treas. dept. doc. 1100.)

Tide tables for the Atlantic coast of the United States, together with 206 stations on the Atlantic coast of British America, for the year 1890. [T. C. Mendenhall, superintendent.]
237 pp. $27^{cm}$. (Treas. dept. doc. 1210.)

Tide tables for the Pacific coast of the United States, together with 121 stations in Lower California, British Columbia, and Alaska territory, for the year 1890.
105 pp. $27^{cm}$. (Treas. dept. doc. 1233.)

Tide tables for the Atlantic coast of the United States, together with 206 stations on the Atlantic coast of British America, for the year 1891.
250 pp. $27^{cm}$. (Treas. dept. doc. 1263.)

Tide tables for the Pacific coast of the United States, together with 121 stations in Lower California, British Columbia, and Alaska territory, for the year 1891.
111 pp. $27^{cm}$. (Treas. dept. doc. 1306.)

Tide tables for the Atlantic coast of the United States, together with 206 stations on the Atlantic coast of British America, for the year 1892.
250 pp. $27^{cm}$. (Treas. dept. doc. 1402.)

Tide tables for the Pacific coast of the United States, with 132 stations in Lower California, British Columbia, and Alaska, for the year 1892.
221 pp. $18^{cm}$. (Treas. dept. doc. 1425.)

Tide tables for the Atlantic coast of the United States, together with 206 stations on the Atlantic coast of British America, for the year 1893.
253 pp. $27^{cm}$. (Treas. dept. doc. 1493.)

Tide tables for the Pacific coast of the United States, together with 150 stations in Lower California, British Columbia, and Alaska, for the year 1893.
221 pp. $18^{cm}$. (Treas. dept. doc. 1513.)

Tide tables for the Atlantic coast of the United States, together with 207 stations in British America, for the year 1894.
253 pp. 27cm. (Treas. dept. doc. 1580.)

Tide tables for the Pacific coast of the United States, together with 150 stations in Lower California, British Columbia, and Alaska, for the year 1894.
221 pp. 18cm. (Treas. dept. doc. 1581.)

Tide tables for the Atlantic coast of the United States, together with 207 stations in British America, for 1895. [W. W. Duffield, superintendent.]
257 pp. 27cm. (Treas. dept. doc. 1626.)

Tide tables for the Pacific coast of America, together with stations in Asia, Australia, and islands in the Pacific Ocean, for the year 1895.
308 pp. 27cm. (Treas. dept. doc. 1661.)

Tide tables for the year 1896, by the U. S. Coast and geodetic survey.*
458 pp. 27cm. (Treas. dept. doc. 1781.)

Tide tables for the Pacific coast of the United States (reprinted from Tide tables for 1896), by U. S. Coast and geodetic survey, W. W. Duffield, superintendent.*
28 pp. 27cm.

Tide tables for the year 1897, by the U. S. Coast and geodetic survey, W. W. Duffield, superintendent.*
458 pp. 27cm. (Treas. dept. doc. 1854.)

Tide tables for the Pacific coast of the United States (reprinted from Tide tables for 1897), by the U. S. Coast and geodetic survey.*
42 pp. 27cm.

Tide tables for the year 1898, by the U. S. Coast and geodetic survey, W. W. Duffield, superintendent.
466 pp. 27cm. (Treas. dept. doc. 1914.)

Tide tables for the Pacific coast of the United States (reprinted from Tide tables for 1898), by the U. S. Coast and geodetic survey.*
44 pp. 27 cm.

Tide tables for the year 1899, by the U. S. Coast and geodetic survey, Henry S. Pritchett, superintendent.
470 pp. 27cm. (Treas. dept. doc. 2001.)

Tide tables for the Pacific coast of the United States (reprinted from Tide tables for 1899), by the U. S. Coast and geodetic survey.*
52 pp. 27cm.

Tide tables for the year 1900, by the U. S. Coast and geodetic survey, Henry S. Pritchett, superintendent.
487 pp. 27cm. (Treas. dept. doc. 2104.)

Tide tables for the Pacific coast of the United States (reprinted from Tide tables for 1900), by the U. S. Coast and geodetic survey.
62 pp. 27cm.

Tide tables for the year 1901, by the U. S. Coast and geodetic survey, Henry S. Pritchett, superintendent.
493 pp. 27cm. (Treas. dept. doc. 2172.)

Tide tables for the Atlantic coast of the United States (reprinted from Tide tables for 1901), by the U. S. Coast and geodetic survey.
152 pp. 27cm.

Tide tables for the Pacific coast of the United States (reprinted from Tide tables for 1901), by the U. S. Coast and geodetic survey.
66 pp. 27cm.

Tide tables for the year 1902, by the U. S. Coast and geodetic survey, O. H. Tittmann, superintendent.
492 pp. 27cm. (Treas. dept. doc. 2218.)

Tide tables for the Atlantic coast of the United States (reprinted from Tide tables for 1902), by the U. S. Coast and geodetic survey.
152 pp. 27cm.

Tide tables for the Pacific coast of the United States (reprinted from Tide tables for 1902), by the U. S. Coast and geodetic survey.
136 pp. 27cm.

Tide tables for the year 1903.
492 pp. 27cm. (Treas. dept. doc. 2267.)

Title preceded by departmental and survey heading on this volume and the two reprints. O. H. Tittmann, superintendent.

Tide tables for the Atlantic coast of the United States (reprinted from Tide tables for 1903).
152 pp. 27cm.

Tide tables for the Pacific coast of the United States (reprinted from Tide tables for 1903).
136 pp. 27cm.

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* Exhausted.

# CATALOGUES OF MAPS AND CHARTS.

These began as one-page circulars, giving a list of the maps and charts engraved. The list was printed also as an appendix to the report, but was not arranged geographically until 1855. New and revised editions are issued whenever necessary, and include all of the charts that have been issued since 1850, except those superseded and canceled. Diagrams opposite each page show the limits of each chart.

List of the individual maps executed and delivered. 1843.*
1 p. 23$^{cm}$.
Describes 8 maps and charts published between 1835–1842.
In Report of Select committee on coast survey, H. rept. 43, 27th Cong., 3d sess. Published also as H. rept. 170, 27th Cong., 3d sess.
All of the lists to and including 1866 were issued under A. D. Bache, superintendent.

List of Coast survey maps engraved.
Rept. 1849, app. 2* bis, p. 70.
Describes 33 maps and charts published between 1842–1849.

List of Coast survey maps engraved.
Rept. 1850, app. 38,* pp. 131, 132.
Describes 43 maps and charts published between 1842–1850.

List of Coast survey maps, sketches, and preliminary charts, engraved and engraving.
Rept. 1851, app. 11,* pp. 160–162.
Describes 78 maps and charts published between 1842–1851.

List of Coast survey maps, sketches, and preliminary charts engraved and engraving.
Rept. 1852, app. 6,* pp. 81–83.
Describes 89 maps and charts published between 1842–1852.

List of Coast survey maps, sketches, and preliminary charts, engraved and engraving.
Rept. 1853, app. 5,* pp. 10–12.
Describes 129 maps and charts published between 1842–1853.

List of Coast survey maps, preliminary charts and sketches, engraved and engraving.
Rept. 1854, app. 31,* pp. 50–54.
Describes 147 maps and charts published between 1842–1854.

List of Coast survey maps, preliminary charts, and sketches engraved—geographically arranged.
Rept. 1855, app. 36,* pp. 238–242.
Describes 192 maps and charts published between 1842–1855.

List of Coast survey maps, preliminary charts, and sketches engraved—geographically arranged.
Rept. 1856, app. 19,* pp. 148–152.
Describes 221 maps and charts published between 1842–1856.

List of Coast survey maps, preliminary charts, and sketches engraved—geographically arranged.
Rept. 1857, app. 22,* pp. 205–210.
Describes 240 maps and charts published between 1842–1857.

List of Coast survey maps, preliminary charts, and sketches engraved—geographically arranged.
Rept. 1858, app. 19,* pp. 168–174.
Describes 260 maps and charts published between 1842–1858.

List of Coast survey maps, preliminary charts, and sketches engraved—geographically arranged.
Rept. 1859, app. 17*, pp. 192–199.
Describes 268 maps and charts published between 1842–1859.

List of Coast survey maps, preliminary charts, and sketches engraved—geographically arranged.
Rept. 1860, app 19,* pp. 199–205.
Describes 278 maps and charts published between 1842–1860.

List of Coast survey maps, preliminary charts, and sketches engraved—geographically arranged.
Rept. 1861, app. 12,* pp. 154–160.
Describes 290 maps and charts published between 1842–1861.

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*Exhausted.

Catalogue of hydrographic maps, charts, and sketches published by the U. S. Coast survey, 1863.* Washington: Government printing office.
17 pp. 28$^{cm}$.
Describes 242 maps and charts published between 1846–1863.
A. D. Bache, superintendent.

Catalogue of hydrographic maps, charts, and sketches published by the U. S. Coast survey, 1866.* Washington: Government printing office.
17 pp. 28$^{cm}$.
Describes 242 maps and charts published between 1846–1864.
A. D. Bache, superintendent.

Catalogue of hydrographic maps, charts, and sketches published by the U. S. Coast survey, 1867.* Washington: Government printing office.
18 pp. 28$^{cm}$.
Describes 276 maps and charts published between 1846–1867.
Benjamin Peirce, superintendent.

Catalogue of hydrographic maps, charts, and sketches published by the U. S. Coast survey, 1872.* Washington: Government printing office.
20 pp. 28$^{cm}$.
Describes 278 maps and charts published between 1846–1872.
Benjamin Peirce, superintendent.

Catalogue of charts, 1875.* Washington: Government printing office.
28 pp. 28$^{cm}$.
Describes 299 maps and charts published between 1851–1875.
Carlile P. Patterson, superintendent.

Catalogue of charts of the U. S. Coast survey, 1877.* Washington: Government printing office.
29 pp. 28$^{cm}$.
Describes 325 maps and charts published between 1851–1877.
Carlile P. Patterson, superintendent.

Catalogue of charts, 1880.* Washington: Government printing office, 1880.
45 pp. 28$^{cm}$.
Describes 409 maps and charts published between 1846–1880.
Carlile P. Patterson, superintendent.

Catalogue of charts, 1883.* Washington: Government printing office, 1883.
64 pp. 28$^{cm}$.
Describes 389 maps and charts published between 1846–1883.
J. E. Hilgard, superintendent.

Catalogue of charts, 1884.* Washington: Government printing office, 1884.
68 pp. 28$^{cm}$.
Describes 384 maps and charts published between 1846–1884.
J. E. Hilgard, superintendent.

Catalogue of charts, 1886.* Washington: Government printing office, 1886.
72 pp. 28$^{cm}$.
Describes 395 maps and charts published between 1846–1886.
F. M. Thorn, superintendent.

Catalogue of charts and other publications, 1887.* Washington: Government printing office, 1887.
140 pp. 28$^{cm}$.
Describes 458 maps and charts published between 1846–1887.
F. M. Thorn, superintendent.

Catalogue of charts and other publications, 1890.* Washington: Government printing office, 1890.
156 pp. 28$^{cm}$.
Describes 476 maps and charts published between 1846–1890.
T. C. Mendenhall, superintendent.

Catalogue of charts and other publications, 1892.* Washington: Government printing office, 1892.
152 pp. 28$^{cm}$.
Describes 489 maps and charts published between 1846–1892.
T. C. Mendenhall, superintendent.

Catalogue of charts and other publications, 1893.* Washington: Government printing office, 1893.
148 pp. 28$^{cm}$.
Describes 497 maps and charts published between 1846–1893.
T. C. Mendenhall, superintendent.

Catalogue of charts and other publications, 1894.* Washington: Government printing office, 1893.
148 pp. 28$^{cm}$.
Describes 516 maps and charts published between 1846–1894.
W. W. Duffield, superintendent.

Catalogue of charts and other publications, 1896.* Washington: Government printing office, 1896.
142 pp. 28$^{cm}$.
Describes 520 maps and charts published between 1846–1896.
W. W. Duffield, superintendent.

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*Exhausted.

Catalogue of charts, coast pilots, and tide tables, 1897* Washington: Government printing office, 1897. 140 pp. 28cm.

Describes 549 maps and charts published between 1849-1897.
W. W. Duffield, superintendent.

Catalogue of charts, coast pilots, and tide tables, 1899.* Washington: Government printing office, 1899. 142 pp. 28cm.

Describes 579 maps and charts published between 1850-1899.
Henry S. Pritchett, superintendent.

Catalogue of charts, coast pilots, and tide tables, 1900.* Washington: Government printing office, 1900. 150 pp. 28cm.

Describes 587 maps and charts published between 1850-1900.
Henry S. Pritchett, superintendent.

Catalogue of charts, coast pilots, and tide tables, 1902. Washington: Government printing office, 1902. 167 pp. 28cm.

Describes 656 maps and charts published between 1850-1902.
Includes new sections for the West Indies and the Philippines in the geographical arrangement.
Title preceded by departmental and survey heading. O. H. Tittmann, superintendent.

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* Exhausted.

# ADMINISTRATIVE PUBLICATIONS.

Laws and regulations.
Directions in regard to operations.
Instructions in methods of work.
Reports submitting estimates.
Summary or abstract report.
Official reports of expenditures.

## LAWS AND REGULATIONS.*

General rules for estimates, accounts, and classification of expenditures for the guidance of the chiefs of parties of the U. S. Coast survey, 1858. Public printer, June, 1858.
8 pp. $22\frac{1}{2}^{\mathrm{cm}}$.
Signed by Samuel Hein, disbursing agent.

Laws relating to the Survey of the coast of the United States, with the plan of reorganization of 1843, and regulations by the Treasury department. Public printer, July, 1858.
25 pp. $22\frac{1}{2}^{\mathrm{cm}}$.

Statutes relating to the Survey of the coast of the United States, with the plan of reorganization of 1843, and regulations by the Treasury department. Washington: Government printing office, 1869.
27 pp. $19\frac{1}{2}^{\mathrm{cm}}$.

General rules for estimates, accounts, and classification of expenditures for the guidance of the chiefs of parties of the United States Coast survey, 1874.
7 pp. $22^{\mathrm{cm}}$.
Signed by Samuel Hein, disbursing agent.

Laws and regulations relating to the Coast and geodetic survey of the United States. Washington: Government printing office, 1881.
42 pp. $23^{\mathrm{cm}}$.

Laws of general application for use of the United States Coast and geodetic survey. Washington: Government printing office, 1881.
52 pp. $23^{\mathrm{cm}}$. (Treas. dept. doc. no. 167, C. & G. S.)

Laws and regulations relating to the Coast and geodetic survey of the United States. Washington: Government printing office, 1887.
59 pp. $23^{\mathrm{cm}}$.

Regulations for enlistments, discharges, etc., May 5, 1899.
7 pp. $23\frac{1}{2}^{\mathrm{cm}}$. (Treas. dept. doc. no. 2112, C. & G. S.)
Signed by H. S. Pritchett, superintendent.

Rules governing routine and discipline aboard ship, 1899. Washington: Government printing office, 1899.
14 pp. $23^{\mathrm{cm}}$.
Signed by H. S. Pritchett, superintendent.

## DIRECTIONS IN REGARD TO THE OPERATIONS OF THE COAST SURVEY.*

Directions of the Treasury department in regard to the operations of the Coast survey for 1844–'45.
8 pp. $23^{\mathrm{cm}}$.

Directions in regard to the operations of the Coast survey, for 1846–47. Approved by the Treasury department, March, 1846.
10 pp. $23^{\mathrm{cm}}$.

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* Exhausted.

Directions in regard to the operations of the Coast survey, for 1847–48. Approved by the Treasury department, March, 1847.
10 pp. 23$^{cm}$.

Directions in regard to the operations of the Coast survey, for 1848–49. Approved by the Treasury department, April, 1848.
12 pp. 23$^{cm}$.

Directions in regard to the operations of the Coast survey, for 1849–50. Approved by the Treasury department, March 23, 1849.
14 pp. 23$^{cm}$.
[It is probable that this publication was also issued in 1850–51, 1851–52 and 1852–53.]

Directions in regard to the operations of the Coast survey, for 1853–54. Approved by the Treasury department, June 1, 1853.
27 pp. 23$^{cm}$.

Directions in regard to the operations of the Coast survey, for 1854–55. Approved by the Treasury department, 1854.
26 pp. 23$^{cm}$.

Directions in regard to the operations of the Coast survey, for 1855–56. Approved by the Treasury department, 1855.
27 pp. 23$^{cm}$.

Directions in regard to the operations of the Coast survey, for 1856–57. Approved by the Treasury department, 1855.
28 pp. 23$^{cm}$.

Directions in regard to the operations of the Coast survey, for 1857–58. Approved by the Treasury department, 1857.
27 pp. 23$^{cm}$.

Directions in regard to the operations of the Coast survey, 1858–59. Approved by the Treasury department, 1858.
26 pp. 23$^{cm}$.

Directions in regard to the operations of the Coast survey, 1859–60. Approved by the Treasury department, 1859.
26 pp. 23$^{cm}$.

Directions in regard to the operations of the Coast survey, 1860–61. Approved by the Treasury department, 1860.
27 pp. 23$^{cm}$.

## INSTRUCTIONS IN METHODS OF WORK.

Directions for observations of tides.* Printed for the use of the tidal observers from the manuscript instructions, 1852. Gideon & Co., printers.
12 pp. 2 illus.

Self-registering tide gauge. Instructions for observers, 1859.*
16 pp. 23$^{cm}$.
Signed by A. D. Bache, superintendent.

General instructions in regard to the hydrographic work of the Coast survey.* (Printed for the use only of the hydrographic parties.) [1861?]
28 pp. 23$^{cm}$.
Signed by A. D. Bache, superintendent.

General instructions in regard to inshore hydrographic work of the Coast survey, 1878.* Washington: Government printing office, 1878.
50 pp. 23$^{cm}$.
Signed by C. P. Patterson, superintendent.

General instructions for hydrographic work, 1883.* Washington: Government printing office, 1883.
81 pp. 2 fig., 5 diag. 23$^{cm}$.
Signed by J. E. Hilgard, superintendent.

Instructions and memoranda for descriptive reports to accompany original sheets. Washington: Government printing office, 1887.
9 pp. 23$^{cm}$. (Reprinted from Report 1887, app. 11.)
Signed by F. M. Thorn, superintendent.

General instructions for hydrographic parties, 1894.* Washington: Government printing office, 1894.
111 pp. 1 fig., 11 diag. 23$^{cm}$. (Treas. doc. no. 1655, C. & G. S.)
Signed by T. C. Mendenhall, superintendent.

[Amendment to] General instructions for hydrographic parties, 1894.* [Issued] July 1, 1895.
8 pp., printed on one side of the leaf. 23$^{cm}$. (Circular no. 1.)
Signed by T. C. Mendenhall, superintendent.

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*Exhausted.

## REPORT SUBMITTING ESTIMATES.*

Extract from the report of the Superintendent of the coast survey, showing the progress of the work during the year ending November, 1845. J. & G. S. Gideon, printers.
9 pp. 23^cm.
Signed by A. D. Bache, superintendent.

United States Coast survey. [Report submitting estimates.] 1859.
15 pp. 23^cm.
Signed by A. D. Bache, supt. coast survey, Oct. 27, 1859.

United States Coast survey. [Report submitting estimates.] 1860.
14 pp. 23^cm.
Signed by A. D. Bache, superintendent coast survey, station near Fitchburg, Mass., Oct. 15, 1860.

United States Coast survey. [Report submitting estimates.] 1861.
8 pp. 23^cm.
Signed by A. D. Bache, superintendent, New York, Nov. 5, 1861.

United States Coast survey. [Report submitting estimates.] 1862.
9 pp. 23^cm.
Signed by A. D. Bache, superintendent, station near West Chester, Conn.
[It is probable that a report submitting estimates was issued for 1863, 1864, 1865, 1866, 1867, 1868, 1869.]

Report of the Superintendent of the coast survey, September, 1870.
12 pp. 23^cm.
Signed by Benjamin Peirce, superintendent, Washington, Sept. 28, 1870.

Estimates of the Superintendent, U. S. Coast survey, 1870–71.
7 pp. 23^cm.
Signed by Benjamin Peirce, superintendent, Washington, Sept. 30, 1869.

Report of the Superintendent of the United States coast and geodetic survey for the fiscal year ending with June, 1882. Washington: Government printing office, 1882.
18 pp. 23^cm. (Treas. dept. doc. 364.)
Signed by J. E. Hilgard, superintendent, Washington, Dec. 2, 1882.

## ABSTRACT OR SUMMARY REPORT.*

This report is annually prepared in the office of the Survey for incorporation in the report of the Secretary of the treasury. It is not printed separately, although the two following were issued in pamphlet form with a separate document number.

Summary report of the progress of the United States Coast and geodetic survey for the fiscal year ending with June, 1883. Washington: Government printing office, 1884.
21 pp. 23^cm. (Treas. dept. doc. 541.)
Signed by J. E. Hilgard, superintendent, Washington, Dec. 10, 1883.

Summary report of the progress of the United States Coast and geodetic survey for the fiscal year ending with June, 1884. Washington: Government printing office, 1884.
20 pp. 23^cm. (Treas. dept. doc. 652.)
Signed by J. E. Hilgard, superintendent, Washington, November 15, 1884.

## OFFICIAL REPORTS OF EXPENDITURES.

Report by the Secretary of the treasury of the expenditures for the Survey of the United States coast. January 25, 1842.
8 pp. 23^cm. (H. doc. 57, 27th Cong., 2d sess.)

Report of Select committee on the result of an examination of the progress and expenditure of the Coast survey. January, 1843.
103 pp. 23^cm. (H. rept. 43, 27th Cong., 3d sess.)

Report of Select committee. Additional information to that communicated in January by the same committee upon the progress and expenditures of the Coast survey. February, 1843.
93 pp. 23^cm. (H. rept. 170, 27th Cong., 3d sess.)

Report by the Secretary of the treasury on appropriations for the Coast survey. December 22, 1848.
2 pp. 23^cm. (S. ex. doc. 4, 30th Cong., 2d sess.)

Report of Secretary of the treasury regarding Coast survey expenditures and results. February 7, 1849.
111 pp. 23^cm. (S. ex. doc. 26, 30th Cong., 2d sess. In v. 3.)

Report of Secretary of the treasury of number and cost of vessels and number of men employed in Survey of United States coast. February 9, 1849.
9 pp. 23^cm. (S. ex. doc. 29, 30th Cong., 2d sess. In v. 3.)

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*Exhausted.

Secretary of the treasury submits report of Superintendent of coast survey showing number and names of persons employed in Coast survey during year ending June 30, 1853, their compensation and service, with expenditures made under his direction. December 25, 1853.
16 pp. 23$^{\mathrm{cm}}$. (S. doc. 11, 33d Cong., 1st sess. In v. 4.)

Letter from the Secretary of the treasury transmitting a list of the names of persons employed in the Coast survey. December 22, 1853.
16 pp. 23$^{\mathrm{cm}}$. (H. ex. doc. 13. 33d Cong., 1st sess.)

Secretary of the treasury transmits reports showing disbursements in behalf of the Coast survey. December 27, 1854.
10 pp. 23$^{\mathrm{cm}}$. (H. ex. doc. 23, 33d Cong., 2d sess. In v. 5.)

Letter of Secretary of the treasury transmitting report of number and names of persons employed in the Coast survey and expenditures made during the year 1854-55. December 22, 1856.
12 pp. 23$^{\mathrm{cm}}$. (H. ex. doc. 44, 34th Cong., 1st sess. In v. 9.)

Letter from the Secretary of the treasury transmitting a report showing the number and names of persons employed in the Coast survey, etc. December 22, 1856.
12 pp. 23$^{\mathrm{cm}}$. (H. ex. doc. 17, 34th Cong., 3d sess.)

Letter from the Secretary of the treasury transmitting report showing the number and names of persons employed in the Coast survey, together with a statement of expenditures, etc. February 6, 1856.
12 pp. 23$^{\mathrm{cm}}$. (H. ex. doc. 44, 34th Cong., 1st sess.)

Secretary of the treasury transmits list of persons employed in Coast survey and expenditures for year ending June 30, 1857. January 15, 1858.
12 pp. 23$^{\mathrm{cm}}$. (H. ex. doc. 20, 35th Cong., 1st sess. In v. 3.)

Secretary of the treasury reports amount expended and progress made in the Coast survey, and also the standard weights and measures furnished the several states and custom-houses, and their cost. December 16, 1858.
28 pp. 23$^{\mathrm{cm}}$. (S. rept. 6, 35th Cong.. 2d sess. In v. 6.)

Report by Secretary of the treasury of names and salaries of persons employed on the Coast survey. January 7, 1859.
13 pp. 23$^{\mathrm{cm}}$. (H. ex. doc. 29, 35th Cong., 2d sess. In v. 5.)

Letter from the Secretary of the treasury transmitting list of persons employed in the Coast survey. February 8, 1860.
12 pp. 23$^{\mathrm{cm}}$. (H. ex. doc. 9, 36th Cong., 1st sess.)

Report by Secretary of the treasury transmitting list of the number and names of persons employed on the Coast survey, amount of compensation, etc. December 24, 1860.
10 pp. 23$^{\mathrm{cm}}$. (Ex. doc. 15, 26th Cong., 2d sess. In v. 6.)

Report by Secretary of the treasury of expenditures on account of the Coast survey for the year ending June 30, 1861, list of persons employed, salaries, etc. March 6, 1862.
79 pp. 23$^{\mathrm{cm}}$. (H. ex. doc. 68, 37th Cong., 2d sess. In v. 5.)

Report by Secretary of the treasury transmitting list of the number and names of persons employed in the Coast survey and expenditures during the year ending June 30, 1861. March 25, 1862.
11 pp. 23$^{\mathrm{cm}}$. (H. ex. doc. 83, 37th Cong., 2d sess. In v. 7.)
Date of letter Mar. 21, 1862.

Report by Secretary of the Treasury transmitting statement showing number and names of persons employed in the Coast survey during the fiscal year ending June 30, 1863, amount of their compensation, and time of employment, with a statement of all expenditures made during the year. December 16, 1863.
11 pp. 23$^{\mathrm{cm}}$. (H. ex. doc. 13, 38th Cong., 1st sess. In v. 7.)

Report of Secretary of the treasury transmitting list of employees, with compensations and statement of expenditures of Coast survey for fiscal year ending June 30, 1864. December 21, 1864.
9 pp. 23$^{\mathrm{cm}}$. (H. ex. doc. 13, 38th Cong., 2d sess. In v. 8.)

Report of Secretary of treasury transmitting a statement of employees in the Coast survey during the year ending June 30, 1865.
9 pp. 23$^{\mathrm{cm}}$. (H. ex. doc. 24, 39th Cong., 1st sess. In v. 7.)

Report by Secretary of the treasury transmitting list of employees of Coast survey with compensations, etc., for the fiscal year ending June 30, 1886. December 15, 1866.
10 pp. 23$^{\mathrm{cm}}$. (H. ex. doc. 15, 39th Cong., 2d sess. In v. 6.)

Report by Secretary of the treasury on expenses of the Coast survey for the year ending June 30, 1867. May 8, 1868.
9 pp. 23$^{\mathrm{cm}}$. (H. ex. doc. 286, 40th Cong., 2d sess. In v. 17.)

Report by Secretary of the treasury transmitting list of employees, with compensations, and statement of expenditures of Coast survey for fiscal year ending June 30, 1869. January 22, 1870.
8 pp. 23$^{\mathrm{cm}}$. (H. ex. doc. 75, 41st Cong., 2d sess. In v. 6.)

Report by Secretary of the treasury transmitting list of employees of the Coast survey, with compensations, during fiscal year ending June 30, 1870. February 25, 1871.
9 pp. 23$^{\mathrm{cm}}$. (H. ex. doc. 142, 41st Cong., 3rd sess. In v. 12.)

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* Exhausted.

Report of Secretary of the treasury transmitting list of Coast survey employees for year ending June 30, 1874. December 23, 1874.
8 pp. 23$^{cm}$. (H. ex. doc. 71, 43d Cong., 2d sess. In v. 12.)

Report by Secretary of the treasury of expenditures on account of the Coast survey for the fiscal year ending June 30, 1878. January 28, 1879.
7 pp. 23$^{cm}$. (H. ex. doc. 40, 45th Cong., 3d sess. In v. 16.)

Letter from the Secretary of the Treasury in response to a resolution of the House of Representatives concerning the present organization of the Coast and geodetic survey. February 3, 1879.
6 pp. 23$^{cm}$. (H. ex. doc. 62, 45th Cong., 3d sess.)

Report by Secretary of the treasury transmitting a report of expenditures of the Coast and geodetic survey for the year ending June 30, 1879. March 26, 1880.
7 pp. 23$^{cm}$. (H. ex. doc. 68, 46th Cong., 2d sess. In v. 24.)

Report by Secretary of the treasury transmitting a report of the expenditures of the Coast and geodetic survey for the year ending June 30, 1880. January 31, 1881.
7 pp. 23$^{cm}$. (H. ex. doc. 64, 46th Cong., 3d sess. In v. 18.)

Brief report of the Superintendent of the coast and geodetic survey, containing statement of expenditures for the fiscal year ending with June 30, 1882. December 2, 1882.
18 pp. 23$^{cm}$. (Treas. dept. doc. 364.)

Letter from Secretary of the treasury transmitting statement of expenditures of Coast and geodetic survey for the fiscal year ending June 30, 1883. January 22, 1884.
8 pp. 23$^{cm}$. (H. ex. doc. 63, 48th Cong., 1st sess.)

Letter from Secretary of the treasury transmitting statement of expenditures of Coast and geodetic survey for the fiscal year ending June 30, 1884. December 18, 1884.
8 pp. 23$^{cm}$. (H. ex. doc. 52, 48th Cong., 2d sess.)

Letter from Secretary of the treasury transmitting statement of expenditures of the Coast and geodetic survey for the fiscal year ending June 30, 1885. January 9, 1886.
30 pp. 23$^{cm}$. (H. ex. doc. 32, 49th Cong., 1st sess.)

Letter from Secretary of the treasury transmitting statement of expenditures of Coast and geodetic survey for fiscal year ending June 30, 1886. February 4, 1887.
27 pp. 23$^{cm}$. (H. ex. doc. 149, 49th Cong., 2d sess.)

Letter from Secretary of the treasury transmitting statement of expenditures of Coast and geodetic survey for fiscal year ending June 30, 1887. February 11, 1888.
29 pp. 23$^{cm}$. (H. ex. doc. 154, 50th Cong., 1st sess.)

Letter from Secretary of the treasury transmitting statement of expenditures of Coast and geodetic survey for fiscal year ending June 30, 1888. January 2, 1889.
30 pp. 23$^{cm}$. (H. ex. doc. 53, 50th Cong., 2d sess.)

Letter from Secretary of the treasury transmitting statement of expenditures of Coast and geodetic survey for fiscal year ending June 30, 1889. January 2, 1890.
31 pp. 23$^{cm}$. (H. ex. doc. 90, 51st Cong., 1st sess.)

Letter from Secretary of the treasury transmitting statement of expenditures of Coast and geodetic survey for fiscal year ending June 30, 1890. February 26, 1891.
28 pp. 23$^{cm}$. (H. ex. doc. 278, 51st Cong., 2d sess.)

Letter from the Secretary of the treasury transmitting statement of expenditures on account of the U. S. Coast and geodetic survey for the fiscal year ending June 30, 1891. March 1, 1892.
28 pp. 23$^{cm}$. (H. ex. doc. 151, 52d Cong., 1st sess.)
Also published as office report no. 3, Annual report, 1891.

Letter from the Secretary of the treasury transmitting in response to resolution of the 21st inst., information relative to the changes made in the force of employees in the Coast and geodetic survey during the year 1890. March 28, 1892.
8 pp. 23$^{cm}$. (H. ex. doc. 180, 52d Cong., 1st sess.)

Letter from the Secretary of the treasury transmitting statement of expenditures on account of the U. S. Coast and geodetic survey for the year ending June 30, 1892. March 1, 1893.
27 pp. 23$^{cm}$. (H. ex. doc. 253, 52d Cong., 2d sess.)
Also published as office report no. 3, Annual report, 1892.

Letter from the Secretary of the treasury transmitting a statement of expenditures made on account of the U. S. Coast and geodetic survey for the fiscal year ending June 30, 1893. March 22, 1894.
23 pp. 23$^{cm}$. (H. ex. doc. 157, 53d Cong., 2d sess.)
Also published as office report no. 3, Annual report, 1893.

Letter from the Secretary of the treasury transmitting a detailed statement of the expenditures of the Coast and geodetic survey for the fiscal year ending June 30, 1894. February 18, 1895.
22 pp. 23$^{cm}$. (H. ex. doc. 324, 53d Cong., 3d sess.)
Also published as office report no. 3, Annual report, 1894.

Letter from the Secretary of the treasury transmitting a statement of expenditures on account of the Coast and geodetic survey for the fiscal year ended June 30, 1895. June 5, 1896.
21 pp. 23$^{cm}$. (H. ex. doc. 402, 54th Cong., 1st sess.)
Also published as office report no. 3, Annual report, 1895.

Letter from the Acting secretary of the treasury transmitting a statement of expenditures on account of the Coast and geodetic survey for the fiscal year ended June 30, 1896. January 4, 1897.
20 pp. $23^{cm}$. (H. ex. doc. 155, 54th Cong., 2d sess.)
Also published as office report no. 3, Annual report, 1896.

Letter from the Secretary of the treasury transmitting a statement of expenditures in the United States Coast and geodetic survey for the fiscal year ended June 30, 1897.
20 pp. $23^{cm}$. (H. ex. doc. 230, 55th Cong., 2d sess.)
Also published as office report no. 3, Annual report, 1897.

Letter from the Secretary of the treasury, transmitting a statement of the expenditures in the United States Coast and geodetic survey for the year ended June 30, 1898.
22 pp. $23^{cm}$. (H. ex. doc. 215, 55th Cong., 3d sess.)
Also published in Annnal report of this year.

Letter from the Acting secretary of the treasury, transmitting a statement of expenditures in the United States Coast and geodetic survey for the year ended June 30, 1899.
22 pp. $23^{cm}$. (H. ex. doc. 436, 56th Cong., 1st sess.)
Also published in Annual report of this year.

Letter from the Secretary of the treasury, transmitting a statement of the expenditures in the United States Coast and geodetic survey for the year ended June 30, 1900.
18 pp. $23^{cm}$. (H. ex. doc. 465, 56th Cong., 2d sess.)
Also published in Annual report of this year.

Letter from the Acting secretary of the treasury, transmitting a statement of the expenditures in the United States Coast and geodetic survey for the year ended June 30, 1901.
20 pp. $23^{cm}$. (H. ex. doc. 171, 57th Cong., 1st sess.)
Also published in Annual report of this year.

# PART II.—CATALOGUE.

# CLASSIFICATION OF SUBJECT HEADINGS.

This list of subject headings, arranged in logical, systematic order, will enable those who wish to see all the entries on any subject or group of subjects to refer readily to the proper places in the alphabetical arrangement. All of the entries in this catalogue appear under the subjects here given. To this extent only is the classification exhaustive.

## GEODESY.

### GENERAL.

- Arc measures.
- Constitution of the earth.
- Ellipticity of the earth.
  - Spheroid.
- Figure of the earth.
- Plumb line deflection.
- Gravity.
  - Pendulum.
- Geodetic conferences.
  - International geodetic association.
- Instruments.

### ASTRONOMY.

- Geographic positions.
- Azimuth.
- Latitude.
  - Latitude variation.
- Longitude.
  - Longitude (telegraphic).
  - Moon culminations.
  - Lunar distances.
  - Lunar spots.
  - Lunar tables.
  - Occultations.
  - Star transits.
    - Transit errors.
- Time.
  - Star factors.
- Stars.
  - Declination.
  - Polaris.
  - Star catalogues.
- Eclipses.
- Mars.
- Mercury, Transit of.
- Moon.
- Sun.
  - Sun spots.

### ASTRONOMY—continued.

- Venus, Transit of.
- Personal equation.
- Instruments.
  - Artificial horizons.
  - Chronograph.
  - Longitude instrument.
  - Meridian instrument.
    - Meridian telescope.
  - Personal equation apparatus.
  - Transit instrument.
  - Zenith telescope.

### TRIANGULATION.

- Reconnaissance.
- Base measurement.
  - Base measures.
  - Base measuring apparatus.
- Horizontal measures.
  - Signals.
  - Intervisibility.
  - Theodolite.
    - Micrometer.
- Vertical measures.
- Adjustment.
- Geographic positions.

### HYPSOMETRY.

- Leveling.
  - Leveling instruments.
  - Leveling rods.
- Elevations.
  - Bench marks.
  - Sea level.
  - Water levels.
- Vertical measures.
- Barometric hypsometry.

## HYDROGRAPHY.

- Hydrographic surveying.
  - Hydrographic reconnaissance.
  - Hydrographic sheets.
  - Coast pilot (sailing directions).
- Sounding.
  - Depths.
  - Sounding apparatus.
- Tides.
  - Cotidal lines.
  - Earthquake waves.
  - Harbors.
  - Moon.
  - Elevations.
    - Bench marks.
    - Sea level.
    - Water level.
  - Mathematics.
    - Equilibrium theory of tides.
    - Harmonic analysis.
  - Instruments.
    - Tide tables.
    - Tide indicator.
    - Tide gauge.
    - Tide predicting machine.
- Currents.
  - Current float.
  - Current meter.
- Physical hydrography.
  - Anchorages.
  - Bars.
  - Channels.
  - Coast features.
  - Harbors.
  - Oyster beds.
  - Rivers.
  - Sea level.
  - Shoals.
  - Shore line changes.
  - Tide lands.
  - Wind effects on water.
- Oceanography.
  - Ocean depths.
    - Depth recorder.
  - Ocean temperatures.
  - Sea water.
    - Sea water densities (salinity).
      - Hydrometer (densimeter).
  - Sea bottom.
    - Dredging.
    - Dredging apparatus.

## TOPOGRAPHY.

- Topographic conference.
- Topographic sheets.
- Topographic instruments.
  - Plane table.
  - Interranger.
- Three point problem.
- Surveying.
  - Surveys.
    - Land surveys.
- Phototopography.

## TERRESTRIAL MAGNETISM.

- Magnetic elements.
- Magnetic declination.
  - Meridian lines.
- Magnetic inclination.
- Magnetic intensity.
- Magnetic variations.
  - Magnetic variations (secular).
- Magnetic surveys.
- Magnetic methods.
- Magnetic instruments.
  - Dip instrument.
  - Magnetic needle.
  - Magnetometer.
- Magnetic observatories.
- Auroras.
- Atmospheric electricity.

## CHART CONSTRUCTION.

- Projections.
  - Projection tables.
- Drawing.
  - Paper.
  - Lettering.
  - Shading.
  - Pantograph.
- Photography.
- Engraving.
  - Etching.
  - Lithography.
    - Lithographic transfers.
- Electrotyping.
- Printing.
  - Paper.
- Cartography.
  - Charts.
  - Maps.

## ALLIED SUBJECTS.

### MATHEMATICS AND COMPUTATION.

- Arithmetic.
- Equations, solution of.
- Functions.
- Harmonic analysis.
- Interpolation.
- Least square method.
- N point problem.
- Projections.
- Tables.
- Three point problem.
- Trajectory of shot.

### PHYSICS.

- Aberration.
- Expansion.
- Electricity.
  - Electro-magnetism.
  - Transmission time.
- Hydraulics.
- Motion.
  - Viscous fluid.
- Refraction.
- Spectrum.

### STANDARDS.

- Balances.
- Kilogram.
- Meter.
  - Metric tables.
- Mile.
- Weights and measures office.
- Yard.

### GEOGRAPHY.

- Boundaries.
- Eminent domain.
- Expeditions.
- Geographic exploration.
- Geographic names.
- Maps.
- Royal military geographic institute.
- Relief models.
- Voyages.

### GEO-PHYSICS.

- Meteorology.
  - Atmosphere.
    - Atmospheric electricity.
  - Auroras.
  - Climate.
- Refraction.
- Winds.
- Earthquakes.
- Geology.
  - Phosphates.
  - Sand.

### ENGINEERING.

- Marine engineering.
  - Boilers.
    - Coal economy.
  - Engines.
  - Log instruments.
- Hydraulic engineering.
  - Canals.
    - Ship canals.
  - Docks.
  - Harbors.
  - Levees.
  - Light-houses.
  - Piers.
  - Rivers.

### GENERAL.

- Bibliography.
- Expositions.
- History.
- Biography.
- Languages.
- Research.
- Zoology.

# ALPHABETICAL ARRANGEMENT.

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## IN GENERAL.

UNDER AUTHORS....Entries are arranged in chronological order.
UNDER SUBJECTS....General entries are followed by regional subheadings.
UNDER PLACES......General entries are followed by subject subheadings.

For full titles see Part I.

## ABBREVIATIONS.

| | |
|---|---|
| app. | Appendix. |
| Bull. | Bulletin. |
| p. | Page. |
| pt. | Part. |
| Rept. | Report. |

| | |
|---|---|
| Sep. pub. | Separate publication. |
| Sp. pub. | Special publication. |
| * | Exhausted. |
| † | Not for general distribution. |

**A, B, C tables.** *See* Star factors.

**Aberration.**

Preston, E. D. The constant of aberration as determined from a discussion of results for the variation of latitude at Waikiki, Hawaiian islands. Bull. 28. (1893.)

——— The constant of aberration as determined from observations of latitude at San Francisco, California. Bull. 32. (1895.)

——— Determination of the constant of aberration from latitude observations with the zenith telescope at Honolulu, H. I., and San Francisco, Cal. Rept. 1896, pt. 2, app. 10, pp. 353-371.

**Abilene, Kans.—Levels—Norfolk, Neb.**

Tilton, B. E. Resulting elevations from spirit leveling between Abilene, Kans., and Norfolk, Neb. Rept. 1899, app. 6, pp. 299-320.

**Ackley, Seth Mitchell.**

Hydrography. No. 8 in Bull. 29. (1893.)

**Adjustment.**

Doolittle, M. H. [Solution of normal equations and adjustment of triangulation]. Rept. 1878, app. 8, paper no. 3, pp. 115-120.

Kummell, C. H. On the direct synthetical method of adjusting a triangulation. Rept. 1892, pt. 2, app. 12, pp. 535-552.

Schott, C. A. Adjustment of horizontal angles of a triangulation. Probable error of observation, derived from observations of horizontal angles at any single station and depending on directions. Rept. 1854, app. 33S,* pp. 70-95.

——— (And Doolittle, M. H.) Method of closing a circuit of triangulation under certain conditions. Rept. 1875, app. 17,* pp. 279-292.

——— Observations of atmospheric refraction. Contribution no. 11. Determination of several heights by the spirit level, and measures of refraction by zenith distances; also observations of the barometer at Ragged mountain, Me., by F. W. Perkins. Rept. 1876, app. 17, pp. 355-367.

——— Atmospheric reduction and adjustment of hypsometric measures. Contribution no. 111. Determination of the coefficient of refraction from zenith distances observed in northern Georgia, by Assistants C. O. Boutelle and F. P. Webber, in 1873 and 1874, and adjustment of difference of heights by the method of least squares. Rept. 1876, app. 18, pp. 368-387.

*See also* Equations—Least square method—Peirce's criterion—Tables.

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*Exhausted.

**Africa.**

Preston, E. D. Results of observations made to determine gravity and the magnetic elements at stations on the west coast of Africa, and on some islands in the North and South Atlantic, 1889–1890. Rept. 1890, app. 12, pp. 625–684.

——— Same, abstract. Bull. 22. (1891.)

Schott, C. A. The secular variation and annual change of the magnetic force at stations occupied in connection with U. S. Eclipse expedition to the west coast of Africa in 1889–1890. Rept. 1891, pt. 2, app. 3, pp. 21–39.

——— Same. Bull. 23. (1891.)

**Agassiz, Alexander.**

Dredging operations by the Coast survey steamer Blake [in the Caribbean sea]. Rept. 1879, app. 6,* pp. 95–102.

**Agassiz, Louis.**

Examination of the Florida reefs, keys and coast. Rept. 1851, app. 10,* pp. 145–160.

Same, reprint. Rept. 1866, app. 19,* pp. 120–130.

Relation of geological and zoölogical researches to general interests in the development of coast features. Rept. 1867, app. 17,* pp. 183–186.

Report upon deep-sea dredgings in the Gulf Stream during the third cruise of the United States steamer Bibb. Rept. 1869, app. 10,* pp. 208–219.

**Agonic line.**

Schott, C. A. Secular variation in the position of the agonic line of the North Atlantic and of America, between the epochs 1500 and 1900 A. D. Bull. 6. (1888.)

*See also* Magnetic declination.

**Alabama.**

GEOGRAPHIC POSITIONS. Geographical positions determined, approximately, in West Virginia, Kentucky, Tennessee, Alabama, Mississippi and Missouri. Rept. 1865, app. 10,* p. 137.

LEVELING. Schott, C. A. Heights from spirit levelings of precision between Mobile, Ala., and Carrollton [New Orleans], La. Rept. 1887, app. 9. pp. 185–205.

——— Heights from spirit leveling of precision between Mobile, Ala., and Okolona, Miss. Rept. 1888, app. 10, pp. 409–426.

*See also* Dauphin island base—Gulf coast—Gulf Stream—Mobile—Mobile bay entrance—Montgomery.

**Alaska.**

Notes on Alaska from recent surveys. Bull. 2. (1888.)

Dall, W. H. Geographical and hydrographical explorations on the coast of Alaska. Rept. 1873, app. 11,* pp. 111–122.

Davidson, G. Coast features and resources, Alaska territory. Rept. 1867, app. 18,* pp. 187–329.

——— Resources of and developments in Alaska. Bull. 4. (1888.)

BOUNDARY. Dall, W. H. Boundary line between the territory of the United States and of Russia, passing through Bering strait. Rept. 1880, app. 16,* sup. note, pp. 335–340.

COAST PILOT. Sailing directions for inland passage between Sitka harbor and Hooniah sound, through Olga strait, Neva strait, and Peril strait, Alaska. Notice to mariners 61. (1885.)

Jarvis, D. H. Coast pilot notes on the Fox islands passes, Unalaska bay, Bering sea, and Arctic ocean as far as Point Barrow. Bull. 40. (1900.)

Moser, J. F. Hydrographic notes and sailing directions relating to portions of Alaska from Dixon entrance to Yakutat bay, including reconnaissance surveys of Cordova bay, Bucarelli bay, and Red Fish bay, 1897. Bull. 37. (1899.)

——— Alaska. Hydrographic notes, sailing directions, and charts of surveys relating to the vicinity of Prince William sound, Cook inlet, Kadiak island, and route from Unalaska to Chignik, through Unimak pass and inside the islands, 1897. Bull. 38. (1899.)

Rodman, Hugh (compiler). Alaska. General information relating to the vicinity of Chatham and Peril straits, from a recent survey by the U. S. Coast survey steamer Patterson, Lieut. Commander E. K. Moore, U. S. N., commanding, and Cooks inlet and the region to the Westward, by W. H. Dall, U. S. Geological survey. Bull. 35. (1897.)

——— Same. Rept. 1896, app. 11, pp. 373–393.

*See also* List of Coast pilots in Part I.

CURRENTS. Dall, W. H. Harbors of Alaska and the tides and currents in their vicinity. Rept. 1872, app. 10,* pp. 177–212.

GEOGRAPHIC POSITIONS. List of geographical positions in Alaska. Rept. 1867, app. 18A,* pp. 265–274.

Schott, C. A. Standard geodetic positions in southeastern Alaska, depending on astronomic observations 1892, 1893, and 1894. Rept. 1894, pt. 2, app. 3,* pp. 71–85.

GRAVITY. Mendenhall, T. C. Determinations of gravity with the new half-second pendulums of the Coast and geodetic survey at stations on the Pacific coast, in Alaska, and at the base stations, Washington, D. C., and Hoboken, N. J. Rept. 1891, pt. 2, app. 15, pp. 503–564.

HARBORS. Dall, W. H. Harbors of Alaska and the tides and currents in their vicinity. Rept. 1872, app. 10,* pp. 177–212.

LANGUAGES. Vocabularies of the Kodiac, Unalashka, Kenai, and Sitka languages. Rept. 1867, app. 18G,* pp. 293–298.

---

* Exhausted.

LATITUDE. Schott, C. A. Abstract of resulting latitudes of some prominent stations in Alaska and adjacent parts as astronomically determined during 1889–1895. Rept. 1895, pt. 2, app. 2, pp. 321–332.

LONGITUDE. Schott, C. A. Abstract of resulting longitudes of some prominent stations in Alaska and adjacent parts, as astronomically determined during 1889–1895. Rept. 1895, pt. 2, app. 3, pp. 333–344.

TERRESTRIAL MAGNETISM. Schott, C. A. The distribution of the magnetic declination in the United States for the epoch 1890. Rept. 1889, app. 11, pp. 233–402.

——— Results of magnetic observations at stations in Alaska and in the Northwest territory of the Dominion of Canada. Rept. 1892, pt. 2, app. 11, pp. 529–533.

——— Distribution of the magnetic declination in Alaska and adjacent waters for 1895, and construction of an isogonic chart for the same epoch. Rept. 1894, pt. 2, app. 4, pp. 87–100.

——— Same, abstract. Bull. 34. (1895.)

TIDES. Dall, W. H. Harbors of Alaska and the tides and currents in their vicinity. Rept. 1872, app. 10,* pp. 177–212.

Moore, E. K. Predicted times of slack water at Seymour narrows, Discovery passage, B. C., and at Sergius narrows, Peril strait, Alaska, from May to December, 1899. Bull. 39. (1899.)

*See also* List of Tide tables in Part I.

TOPOGRAPHY. Dall, W. H. Mount St. Elias, Mount Fairweather and some of the adjacent mountains [Alaska]. Rept. 1875, app. 10,* pp. 157–188.

Wainwright, D. B. Model of United States and Alaska. (In The methods and results of the U. S. Coast and geodetic survey as illustrated at the World's columbian exposition, 1893.) No. 13 in Bull. 29. (1893.)

*See also* Canada—Fish bay—Kadiak—Muir glacier—Northwest coast—Ooglaamie—Pacific coast—Pribilof islands—St. Paul island—Unalaska—Unga—United States—Wrangell strait.

**Albany, N. Y.—Longitude—New York city.**

Gould, B. A. Determination of longitude at Albany, N. Y., by the telegraphic method. Rept. 1861, app. 18, pp. 221–232.

**Albemarle sound, N. C.**

Pourtales, L. F. Effect of winds in varying the level of the water in Albemarle sound. Rept. 1856, app. 43,* pp. 271, 272.

**Alden, James.**

Reconnaissance from San Francisco to San Diego, including Santa Barbara islands and channel. Rept. 1852, app. 18,* pp. 104–107.

The coast, harbors and commerce of Washington territory. Rept. 1855, app. 29,* pp. 188–192.

**Aleutian islands, Alas.**

Moser, J. F. Alaska. Hydrographic notes, sailing directions, and charts of surveys relating to the vicinity of Prince William sound, Cook inlet, Kadiak island, and route from Unalaska to Chignik, through Unimak pass and inside the islands. Bull. 38. (1899.)

**Alexander, Stephen.**

Expedition to [Aulezavik island] Labrador, to observe the total eclipse of the 18th of July, 1860. Rept. 1860, app. 21,* pp. 229–275.

**Algué, José.** (Compiler.)

Atlas of the Philippine islands. Sp. pub. 3*. (1900.)

**Alice base, Tex.**

Baldwin, A. L. On the measurement of nine base lines along the ninety-eighth meridian. Rept. 1901, app. 3, pp 229–302.

**Alidade.** *See* Plane table.

**Allegheny, Pa.**

Peirce, C. S. Determinations of gravity at Allegheny, York and Ebensburg, Pa. Rept. 1883, app. 19, pp. 473–487.

**Altitude of polaris.** *See* Polaris, Altitude of.

**Amelia island, Fla.** *See* Fernandina, Fla.

**America.**

GRAVITY. Peirce, C. S. Measurements of gravity at initial stations in America and Europe. Rept. 1876, app. 15,* pp. 202–416.

HISTORY. Fox, G. V. An attempt to solve the problem of the first landing place of Columbus in the New World. Rept. 1880, app. 18,* pp. 346–411.

TERRESTRIAL MAGNETISM. Schott, C. A. Secular change of the magnetic declination in the United States and other parts of North America. Rept. 1874, app. 8,* pp. 72–108.

——— Variation of the compass off the Bahama islands at the time of the landfall of Columbus in 1492. Rept. 1880, app. 19, pp. 412–417.

——— Secular variation in the position of the agonic line of the North Atlantic and of America, between the epochs 1500 and 1900 A. D. Bull. 6. (1888.)

*See also* Alaska—Arctic ocean—Atlantic ocean—Canada—Darien—Gulf of Maine—Gulf Stream—Mexico—Northwest coast—Pacific ocean—Peruvian arc—United States.

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*Exhausted.

**American arc of the parallel.** *See* Transcontinental arc.

**Anchorages.**

Marindin, H. L. Changes in the shore line and anchorage areas of Cape Cod (or Provincetown) harbor, by a comparison of surveys between 1835, 1867, and 1890. Rept. 1891, pt. 2, app. 8, pp. 283–288.

——— Changes in the shore lines and anchorage areas of Cape Cod (or Provincetown) harbor, as shown by a comparison of surveys made between 1867 and 1890. Bull. 24. (1891.)

*See also* Coast pilot—Depths—Harbors—Hydrographic surveys—Soundings—Tides.

**Annapolis, Md.—Levels—Washington, D. C.**

Schott, C. A. Result of spirit leveling between tide water at Annapolis, Md., and the Capitol bench mark at Washington, D. C. Rept. 1889, app. 15, pp. 461–466.

**Anthony base, Kans.**

Baldwin, A. L. On the measurement of nine base lines along the ninety-eighth meridian. Rept. 1901, app. 3, pp. 229–302.

**Arc measures.**

EASTERN OBLIQUE. Schott, C. A. The Eastern oblique arc of the United States and osculating spheroid. Sp. pub. 7. (1902.)

——— Primary triangulation between Kent island, Maryland, and Atlanta [Georgia] base lines. Rept. 1878, app. 8, pp. 92–120.

——— Report on the method of reduction and results of connexion of the Epping base line with the primary triangulation in the eastern States. Rept. 1864, app. 14,* pp. 120–144.

NANTUCKET (MERIDIAN). Schott, C. A. Measures of arc of meridian of 3° 23′ between Nantucket (Mass.) and Farmington, Me. Rept. 1868, app. 9,* pp. 147–153.

PAMPLICO-CHESAPEAKE (MERIDIAN). Schott, C. A. The Pamplico-Chesapeake arc of the meridian and its combination with the Nantucket and the Peruvian arcs for a determination of the figure of the earth from American measures. Rept. 1877, app. 6, pp. 84–95.

PERUVIAN (MERIDIAN). Preston, E. D. The need of a remeasurement of the Peruvian arc. Rept. 1889, app. 7,* pp. 199–208.

Schott, C. A. Inquiry into the relative value and need of a check of the Peruvian arc of 1736–1743. Rept. 1898, app. 4, pp. 229–232.

TRANSCONTINENTAL (PARALLEL). Schott, C. A. The transcontinental triangulation and the American arc of the parallel. Sp. pub. 4. (1900.)

——— Results of the transcontinental line of geodetic spirit leveling near the parallel of 39°. Part first, from Sandy Hook, N. J., to St. Louis, Mo. Rept. 1882, app. 11,* pp. 517–556.

*See also* Astronomy—Figure of the earth—Hypsometry—Triangulation.

**Arcano del Mare.**

Schott, C. A. The value of the "Arcano del Mare" with reference to our knowledge of the magnetic declination in the earlier part of the seventeenth century. Bull. 5. (1888.)

——— Same. Rept. 1888, app. 6,* pt. 1, pp. 167–170.

**Arctic expeditions.** *See* Alaska—Bering expedition—Greely expedition—Greenland expedition—Labrador.

**Arctic ocean.**

Dall, W. H. Report on the currents and temperatures of Bering sea and adjacent waters. Rept. 1880, app. 16,* pp. 297–340.

Jarvis, D. H. Alaska. Coast pilot notes on the Fox island passes, Unalaska bay, Bering sea, and Arctic ocean as far as Point Barrow. Bull. 40. (1900.)

*See also* Ooglaamie.

**Arctic regions.**

Schott, C. A. Magnetic work of the Greely arctic expedition. Rept. 1887, app. 10, pp. 207–210.

*See also* Alaska—Greenland—Labrador.

**Arithmetic.**

Peirce, Benjamin. A new system of binary arithmetic. Rept. 1876, app. 6, pp. 81, 82.

**Arizona.** *See* Date creek camp.

**Arkansas.**

LEVELING. Schott, C. A. Heights from spirit leveling of precision between New Orleans, La., and Arkansas City, Ark. Rept. 1888, app. 11, pp. 427–453.

——— Heights from spirit leveling of precision between Arkansas City (on the Mississippi river) and Little Rock, Ark. Rept. 1888, app. 12, pp. 455–464.

*See also* Mississippi river.

**Arkansas City, Ark.—Levels—New Orleans, La.**

Schott, C. A. Heights from spirit leveling of precision between New Orleans, La., and Arkansas City, Ark. Rept. 1888, app. 11, pp. 427–453.

**Arkansas City, Ark.—Levels—Little Rock, Ark.**

Schott, C. A. Heights from spirit leveling of precision between Arkansas City (on the Mississippi river) and Little Rock, Ark. Rept. 1888, app. 12, pp. 455–464.

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* Exhausted.

**Artificial horizons.**

Lane, J. Homer. New form of mercurial horizon. Rept. 1871, app. 16, pp. 189-192

**Ascension island.** *See* Atlantic islands.

**Asia.**

Schott, C. A. On the magnetic observations made during Bering's first voyage to the coasts of Kamchatka and eastern Asia in the years 1725-1730. Rept. 1891, pt. 2, app. 5, pp. 269-273.

——— Same. Bull. 20. (1890.)

Smith, Edwin. Determinations of gravity with the Kater pendulums at Auckland, New Zealand; Sidney, New South Wales; Singapore, British India; Tokio, Japan; San Francisco, Cal.; and Washington, D. C. Rept. 1884, app. 14, p. 439-473.

*See also* Nagasaki—Pacific ocean—Philippine islands—Siberia.

**Association geodesique internationale.** *See* International geodetic association.

**Astoria, Ore.**

Bache, A. D. Comparison of the diurnal inequality of the tides at San Diego, San Francisco and Astoria with tables. Rept. 1854, app. 46,* pp. 152-155.

**Astronomy.** *See* Aberration—Azimuth—Eclipses—Instruments—Latitude—Latitude variation—Least squares—Longitude—Mars—Micrometric measures—Mercury—Moon—Personal equation—Plumb line deflection—Pleiades—Polaris—Eclipse—Star catalogues—Sun—Tables—Tides—Time—Transits—Venus.

**Atlanta (Peach Tree ridge base), Ga.**

Schott, C. A. Measurement of a primary base line on Peach Tree ridge, near Atlanta, Ga., in 1872 and 1873. Rept. 1873, app. 12,* pp. 123-131.

**Atlantic cable.** *See* Longitude (telegraphic).

**Atlantic coast of the United States.**

COAST PILOT. *See* List of Coast pilots in Part I.

HISTORY. Kohl, J. G. Abstract of an historical memoir concerning the progress of exploration on the Atlantic coast of the United States. Rept. 1856, app. 65,* pp. 319-322.

TERRESTRIAL MAGNETISM. Schott, C. A. Discussion of the secular change in the magnetic declination on the Atlantic and part of the Gulf coasts of the United States. Rept. 1855, app. 48,* pp. 306-337.

TIDES. Bache, A. D. Preliminary determinations of cotidal lines on the Atlantic coast of the United States, from Coast survey observations. Rept. 1854, app. 45,* pp. 147-152.

——— Heights of the tides of the Atlantic coast of the United States relative to the configuration of the coast. Rept. 1857, app. 33,* pp. 342-347.

*See also* List of Tide tables in Part I.

*See also* Atlantic ocean—Chesapeake bay—Delaware river—Gulf of Maine—Gulf Stream—Long Island sound—New England.

**Atlantic islands.**

Preston, E. D. Gravity and the magnetic elements on the west coast of Africa [and on some islands in the North and South Atlantic]. 1889-1890. Rept. 1890, app. 12, pp. 625-684.

——— Same, abstract. Bull. 22. (1891.)

**Atlantic ocean.**

Hilgard, J. E. Description of a model of the depths of the sea in the Bay of North America and Gulf of Mexico. Rept. 1884, app. 17, pp. 619-621.

CURRENTS. Copy of card in current bottle thrown over near Sandy Hook and picked up on the bar at Santa Cruz, one of the western islands [of the Azores]. Rept. 1855, app. 54,* pp. 359.

Off-shore current observations. Information of special importance to mariners. Notice to mariners 114. (1889.)

Current bottle Mobile bay to Mosquito inlet and Cape Florida to Jupiter inlet. Rept. 1854, app. 52,* pp. 189, 190.

Libby, William, jr. Relations of cold and warm ocean currents off the New England coast, by the U. S. Fish commission, with the co-operation of the U. S. Coast and geodetic survey. Rept. 1891, pt. 2, app. 7,* pp. 279-281.

SOUNDINGS. Pillsbury, J. E. Recent deep-sea soundings off the Atlantic coast of the United States. Rept. 1882, app. 19,* pp. 459-461.

TERRESTRIAL MAGNETISM. Fox, G. V. An attempt to solve the problem of the first landing place of Columbus in the New world. Rept. 1880, app. 18, pp. 346-411.

Schott, C. A. Secular variation in the position of the agonic line of the North Atlantic and of America, between the epochs 1500 and 1900 A. D. Bull. 6. (1888.)

*See also* Atlantic coast—Aulezavik island—Caribbean sea—Gulf of Maine—Gulf coast—Gulf Stream.

**Atlases.** *See* Maps.

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* Exhausted.

**Atmosphere.**

Ferrel, William. Meteorological researches for the use of the Coast pilot. Rept. 1875, app. 20,* pp. 369–412.

*See also* Atmospheric electricity—Meteorology—Refraction.

**Atmospheric electricity.**

Alexander, Stephen. Expedition to Labrador to observe the total eclipse of the 18th of July, 1860, [and] report on the determination of the magnetic elements, by Edward Goodfellow, assistant, with notes by C. A. Schott, assistant. Rept. 1860, app. 21,* pp. 229–275.

Cutts, R. D., and Young, Chas. A. Astronomical and meteorological observations made at Sherman, Wyo. T. Rept. 1872, app. 8,* pp. 75–172.

*See also* Auroras—Eclipses—Terrestrial magnetism.

**Atmospheric refraction.** *See* Refraction.

**Attraction** (**Local**). *See* Plumb-line deflection.

**Auckland, New Zealand.**

Smith, Edwin. Determinations of gravity with the Kater pendulums at Auckland, N. Z.; Sydney, New South Wales; Singapore, British India; Tokio, Japan; San Francisco, Cal., and Washington, D. C. Rept. 1884, app. 14, pp. 439–473.

**Aulezavik island, Labrador.**

Alexander, Stephen. Report of the expedition to [Aulezavik island] Labrador, to observe the total eclipse of the 18th of July, 1860. Rept. 1860, app. 21,* pp. 229–275.

**Auroras.**

Alexander, Stephen. Expedition to Labrador, to observe the total eclipse of the 18th of July, 1860, [and] report on the determination of the magnetic elements, by Edward Goodfellow, assistant, with notes by C. A. Schott, assistant. Rept. 1860, app. 21,* pp. 229–275.

Bache, A. D. Investigation of the eleven-year period and of the disturbances of the vertical component of the magnetic force, with a supplement on the effect of auroral lights. Part VII of Discussion of the magnetic and meteorological observations made at the Girard college observatory, Philadelphia, in 1840, 1841, 1842, 1843, 1844, and 1845. Rept. 1863, app. 19,* pp. 156–183.

*See also* Atmospheric electricity—Terrestial magnetism.

**Avery, Robert Stanton.**

Mode of forming a brief tide table for a chart, with examples. Rept. 1868, app. 6,* pp. 103–108.

Results of computed tide tables for charts of the western coast of the United States. Rept. 1870, app. 5,* pp. 66–69.

Mode of forming prediction tide tables. Rept. 1870, app. 6,* pp. 70–74.

Field and office work relating to tides. Rept. 1872, app. 6,* pp. 69–72.

Mode of registering tidal observations. Rept. 1876, app. 8*, pp. 130–142.

**Azimuth.**

Formulæ, tables and example for computing geodetic latitudes, longitudes and azimuths. Rept. 1860, app. 36,* pp. 361–391.

Same. Ed. 2. Much enlarged. Title changed to Formulæ and factors for the computation of geodetic latitudes, longitudes and azimuths. Rept. 1875, app. 19, pp. 315–368.

Same. Ed. 3. Rept. 1884, app. 7,* pp. 323–375.

Same. Ed. 4. Title changed to Formulæ and tables for the computation of geodetic positions. Rept. 1894, pt. 2, app. 9, pp. 277–348.

Davidson, George. Changes of elevation and azimuth caused by the action of the sun at station, Dominguez, Cal. Rept. 1870, app. 17,* pp. 178, 179.

——— Azimuth and apparent altitude of Polaris. Rept. 1870, app. 22,* pp. 225–227.

——— Astronomical observations on the Sierra Nevada. Rept. 1872, app. 9,* pp. 173–176.

Hayford, J. F. Determination of time, longitude, latitude and azimuth. Rept. 1898, app. 7, pp. 261–409.

Hilgard, J. E. Method of observing azimuth; form of record and reduction. Rept. 1856, app. 27,* pp. 208, 209.

Putnam, G. R. Tables of azimuth and apparent altitude of Polaris at different hour angles. Rept. 1895, pt. 2, app. 10, pp. 393–398.

Schott, C. A. Astronomical azimuth. Rept. 1866, app. 11,* pp. 86–99.

——— Astronomical azimuth. Rept. 1880, app. 14,* pt. 4, pp. 201–286.

——— Approximate times of culminations and elongations and the azimuths at elongation of Polaris for the years between 1889 and 1910. Bull. 14. (1889.)

——— Same. Rept. 1891, pt. 2, app. 1, pp. 7–13.

——— Determination of an azimuth from micrometric observations of a close circumpolar star near elongation. Bull. 21. (1890.)

——— Same. Rept. 1891, pt. 2, app. 2, pp. 15–19.

*See also* Meridian instrument—Micrometric measures—Plumb-line deflection—Polaris—Transit instrument.

**Azores.** *See* Atlantic islands.

---

* Exhausted.

**Bache, Alexander Dallas.**

Extract from the report of the Superintendent, showing the progress of the work during the year ending November, 1845.* (1845?)

Sailing directions to accompany the new chart of the western coast of the United States. Sep. pub. (1850.)*

Notices of the western coast of the United States. Sep. pub. (1851.)*

Discussion of tidal observations at Cat island. Rept. 1851, app. 7,* pp. 127-136.

Method used in the Coast survey of showing current observations. Rept. 1851, app. 8,* pp. 136, 137.

Trinidad, Humboldt, and San Diego bays. Rept. 1851, app. 50,* pp. 528-530.

Discussion of tidal observations at Cat island, in the Gulf of Mexico. Rept. 1852, app. 22,* pp. 111-122.

Tide tables for the United States. Rept. 1853, app. 26,* pp. 67-70.

On the tides at Key West, Fla. Rept. 1853, app. 27,* pp. 71-76.

On the tides of San Francisco bay [at Rincon point], Cal. Rept. 1853, app. 28,* pp. 77-81.

Notes on the tides at San Francisco, Cal. Rept. 1853, app. 29,* pp. 81, 82.

Comparison of the reduction of horizontal angles by the methods of "dependent directions" and of "dependent angular quantities" by the method of least squares. Rept. 1854, app. 33,* pp. 63-95.

Preliminary determination of cotidal lines on the Atlantic coast of the United States, from Coast survey observations. Rept. 1854, app. 45,* pp. 147-152.

Comparison of the diurnal inequality of the tides at San Diego, San Francisco, and Astoria, with tables. Rept. 1854, app. 46,* pp. 152-155.

On the distribution of temperatures in and near the Gulf Stream. Rept. 1854, app. 47,* pp. 156-161.

Tide tables for the United States. Rept. 1854, app. 51,* pp. 180-189.

(And Hilgard, J. E.) Table of magnetic declinations (in geographical order) from Coast survey observations. Rept. 1855, app. 47,* pp. 295-306.

Cotidal lines of the Pacific coast. Rept. 1855, app. 50,* pp. 338-342.

Notice of earthquake waves on the western coast of the United States, December 23 and 25, 1854. Rept. 1855, app. 51,* pp. 342-346.

Tidal observations on the Gulf of Mexico and type curves at the several stations, showing their decomposition into diurnal and semidiurnal tides. Rept. 1855, app. 52,* pp. 346, 347.

Tide tables for the use of navigators. Rept. 1855, app. 53,* pp. 347-359.

Tide tables for the use of navigators. Rept. 1856, app. 17,* pp. 120-133.

(And Hilgard, J. E.) On the general distribution of terrestrial magnetism in the United States. Rept. 1856, app. 28,* pp. 209-225.

Notes on the progress made in prediction tables for the tides of the United States coast. Rept. 1856, app. 34,* pp. 249-251.

Approximate cotidal lines of diurnal and semidiurnal tides of the coast of the United States on the Gulf of Mexico. Rept. 1856, app. 35,* pp. 252-260.

Causes of increase of the Sandy Hook peninsula. Rept. 1856, app. 38,* pp. 263, 264.

Winds of the coast of the United States on the Gulf of Mexico. Rept. 1856, app. 44,* pp. 272-276.

Tide tables for the use of navigators. Rept. 1857, app. 20,* pp. 157-178.

Notes on the measurement of a base on Epping plains, Me. Rept. 1857, app. 26,* pp. 302-305.

(And Schott, C. A.) Determination of the longitude of Fernandina, Fla., by means of chronometric exchanges with Savannah, Ga. Rept. 1857, app. 30,* pp. 314-324.

Heights of the tides of the Atlantic coast of the United States. Rept. 1857, app. 33,* pp. 342-347.

Winds of the western coast. Rept. 1857, app. 36,* pp. 354-358.

Report to Commissioner of general land office on progress made in survey and marking of the Florida keys in quarter sections. Rept. 1857, app. 42,* pp. 382-390.

On a supposed personal equation in the use of the zenith telescope for determining latitude by Talcott's method. Rept. 1858, app. 20,* pp. 184-186.

Tidal currents of New York harbor, near Sandy Hook. Rept. 1858, app. 27, pp. 197-203.

Superintendent's report to Commissioner of general land office on progress made in surveying and marking of the Florida keys, continued. Rept. 1858, app. 35,* pp. 225-227.

Tide tables for the use of navigators. Rept. 1858, app. 43,* pp. 275-297.

Tide tables for the use of navigators. Rept. 1859, app. 14,* pp. 136-167.

Investigation of the eleven-year period in the amplitude of the solar-diurnal variation and of the disturbances of the magnetic declination. Part I of Observations made at the Girard college observatory. Rept. 1859, app. 22,* pp. 278-295.

Gulf Stream explorations. Third memoir: Distribution of temperature in the water of the Florida channel and straits. Rept. 1859, app. 25,* pp. 306-310.

Self registering tide gauge. Instructions for observers. Instructions in methods of work. Administrative pub. 1859.

Tide tables for the use of navigators. Rept. 1860, app. 16,* pp. 131-164.

Gulf Stream. Rept. 1860, app. 17,* pp. 165-176.

Investigation of the solar-diurnal variation in the magnetic variation, and its annual inequality. Part II of observations made at the Girard college observatory. Rept. 1860, app. 23,* pp. 293-312.

Investigation of the influence of the moon on the magnetic declination. Part III of Observations made at the Girard college observatory. Rept. 1860, app. 24,* pp. 312-324.

---

* Exhausted.

Tide tables for the use of navigators. Rept. 1861, app. 9, pp. 98–131.

Observations of solar eclipse of July, 1860, at Gunstock mountain, N. H. Rept. 1861, app. 19, pp. 232–239.

General instructions in regard to the hydrographic work of the Coast survey. Admin. pub. (1861?)

(And Pourtales, L. F., and Schott, C. A.) Tides, currents, magnetic variation and geographic positions of light-houses, Chesapeake bay and its rivers. Sep. pub. (1861.) .

Tide tables for the use of navigators. Rept. 1862, app. 8,* pp. 93–126.

Additional researches on cotidal lines of the Gulf of Mexico. Rept. 1862, app. 9,* pp. 126–128.

Investigation of the eleven (or ten) year period and of the disturbances of the horizontal component of the magnetic force. Part IV of the Observations made at the Girard college observatory. Rept. 1862, app. 15,* pp. 161–186.

Investigation of the solar-diurnal variation and of the annual inequality of the horizontal component of the magnetic force. Part V of the Observations made at Girard college observatory. Rept. 1862, app. 16,* pp. 186–202.

Investigation of the influence of the moon on the magnetic horizontal force. Part VI of the Observations made at Girard college observatory. Rept. 1862, app. 17,* pp. 202–212.

Abstract of results of a magnetic survey of Pennsylvania and parts of adjacent states in 1840 and 1841, with some additional results of 1843 and 1862. Rept. 1862, app. 19,* pp. 212–229.

Earthquake waves on the western coast of the United States on the 23d and 25th December, 1854. Rept. 1862, app. 24,* pp. 238–241.

Tide tables for the use of navigators. Rept. 1863, app. 12,* pp. 84–117.

Investigation of the eleven-year period and of the disturbances of the vertical component of the magnetic force, with a supplement on the effect of auroral lights. Part VII of Observations made at the Girard college observatory. Rept. 1863, app. 19,* pp. 156–183.

Investigation of the solar diurnal variation and of the annual irregularity of the vertical component of the magnetic force. Part VIII of Observations made at the Girard college observatory. Rept. 1863, app. 20,* pp. 183–195.

Investigation of the influence of the moon on the magnetic vertical force. Part IX of Observations made at the Girard college observatory. Rept. 1863, app. 21,* pp. 196–204.

Tide tables for the use of navigators. Rept. 1864, app. 8,* pp. 58–90.

Analysis of the disturbances of the dip and total force. Part X of Observations made at the Girard college observatory. Rept. 1864, app. 16,* pp. 183–190.

Solar diurnal variation and annual inequality of the inclination and total force. Part XI of Observations made at Girard college observatory. Rept. 1864, app. 17,* pp. 191–199.

Discussion of the magnetic inclination and table of absolute values of the declination, inclination, and intensity between 1841 and 1845. Part XII of Observations made at Girard college observatory. Rept. 1864, app. 18,* pp. 199–206.

Results of magnetic observations made in the United States by Prof. J. N. Nicollet between 1832 and 1836. Rept. 1864, app. 19,* pp. 207–210.

Tidal observations at Cat island, Gulf of Mexico. (Reprinted from Report of 1851.) Rept. 1866, app. 18,* pp. 113–119.

*See also*, as Superintendent, Reports and other Survey publications 1844–1864.

**Bache, George Meade.**

Letters on the exploration of the Gulf Stream. Rept. 1846, app. 4,* pp. 46–53.

Table showing temperatures at depths below 700 fathoms, taken by Lieutenants Commanding C. H. Davis, in 1845; George M. Bache, in 1846; and S. P. Lee, in 1847. Rept. 1847, app. 11,* p. 75.

**Bache fund.**

Blair, H. W., and Hilgard, J. E. Records and results of magnetic observations made at the charge of the "Bache fund" of the National academy of sciences, from 1871 to 1876. Rept. 1882, app. 14, pp. 329–426.

**Bahama islands.**

Schott, C. A. Variation of the compass off the Bahama islands at the time of the landfall of Columbus in 1492. Rept. 1880, app. 19, pp. 412–417.

**Bailey, J. W.**

On the characteristics from bottom sounding in the Florida section of the Gulf Stream. Rept. 1855, app. 55,* p. 360.

**Balances.**

Hayford, J. F. Rueprecht balance belonging to the United States Office of standard weights and measures. Rept. 1895, pt. 2, app. 9,* pp. 383–392.

*See also* Standards—Weights and measures office.

**Baldwin, Albert Le Seur.**

On the measurement of nine base lines along the ninety-eighth meridian. Rept. 1901, app. 3, pp. 229–302.

**Ballard, Edward.**

Geographical names on the coast of Maine. Rept. 1868, app. 14, pp. 243–259.

---

* Exhausted.

**Baltimore, Md.**

Preston, E. D. Telegraphic determination of the force of gravity at Baltimore, Md., from simultaneous pendulum observations at Washington and Baltimore. Rept. 1894, pt. 2, app. 2, pp. 57–70.

**Barbados.** *See* Atlantic islands.

**Barnard, Frederick Augustus Porter, and Tresca, H.**

Comparison of an iron metre forwarded to France by the Government of the United States of America. Rept. 1867, app. 7,* pp. 134–137.

**Barnes sound, Fla.**

Survey of the Florida keys and reconnaissance of Barnes sound, Fla. Rept. 1855, app. 25,* pp. 171–176.

**Barometric hypsometry.**

Cutts, R. D. Barometric observations made in connection with the line of spirit leveling, from Raritan bay to the Delaware river to determine the heights above mean tide of primary stations. Rept. 1870, app. 8,* pp. 77–89.

Davidson, George, and Schott, C. A. Comparison of the methods of determining heights by means of leveling, vertical angles and barometric measures, from observations at Bodega head and Ross mountain, Cal. Rept. 1871, app. 11,* pp. 154–170.

——— Same. Rept. 1876, app. 16, pp. 338–354.

Ferrel, W. Barometric hypsometry and reduction of the barometer to sea level. Rept. 1881, app. 10, pp. 225–268.

Schott, C. A. Observation of atmospheric refraction. Contribution no. 11. Determination of several heights by the spirit level, and measures of refraction by zenith distances; also, observations of the barometer at Ragged mountain, Maine, by F. W. Perkins. Rept. 1876, app. 17, pp. 355–367.

*See also* Elevations—Leveling—Refraction.

**Bars.**

Marindin, H. L. Changes in the depths of the bar at the entrance to Nantucket inner harbor, Mass., between 1888 and 1893. Rept. 1895, pt. 2, app. 5, pp. 347–354.

Mitchell, H. Reclamation of tide lands and its relation to navigation. Rept. 1869, app. 5,* pp. 75–104.

*See also* Channels—Currents—Depths—Harbors—Shoals—Shore line changes—Sounding—Tides.

**Bartlett, John Russell.**

Siemens electrical deep-sea thermometer. Rept. 1882, app. 18, pp. 451–457.

**Bartlett, Washington A.**

Examination of reefs in Hell Gate channel and changes produced by blasting. Rept. 1851, app. 56,* pp. 553–558.

On Pot rock, Hell Gate. Rept. 1852, app. 8,* p. 84.

**Base measurement.**

Cutts, R. D. Memoranda relating to the field work of the secondary triangulation. Rept. 1868, app. 7,* pp. 109–139.

Jäderin, Edward. J. H. Gore, translator. On the measurement of base lines with steel tapes and with steel and brass wires. Rept. 1893, pt. 2, app. 5, pp. 125–164.

Tittmann, O. H. On a method of readily transferring the underground mark at a base monument. Rept. 1881, app. 13, pp. 357, 358.

*See also* Base measuring apparatus—Hypsometry—Reconnaissance—Triangulation.

**Base measures.**

CALIFORNIA. Davidson, George. Measurement of the Yolo base. Rept. 1882, app. 8, pp. 139–149.

——— Measurement of the Los Angeles base line, Los Angeles and Orange counties, Cal. Rept. 1889, app. 10, pp. 217–231.

Schott, C. A. Length of the primary base line in Yolo county, Cal. Rept. 1883, app. 11, pp. 273–288.

——— Results deduced from the geodetic connection of the Yolo base line with the primary triangulation of California; also a reduction and adjustment of the Davidson quadrilaterals, forming part of that triangulation. Rept. 1885, app. 9, pp. 441–467.

GEORGIA. Evans, A. W. Topographical reconnaissance of a part of Sapelo island, Georgia, for the selection of a site for a primary base line. Rept. 1857, app. 39,* pp. 374–377.

Schott, C. A. Measurement of a primary base line on Peach Tree ridge, near Atlanta, Ga. Rept. 1873, app. 12,* pp. 123–131.

INDIANA. Mendenhall, T. C., Mosman, A. T., Tittmann, O. H., Woodward, R. S. On the measurement of the Holton base, Holton, Ripley county, Ind., and the St. Albans base, Kanawha county, West Va. Rept. 1892, pt. 2, app. 8, pp. 329–503.

Schott, C. A. Length of the Holton base line, Indiana, with related experimental measures, 1891. Rept. 1894, pt. 2, app. 5,* pp. 101–116.

---

*Exhausted.

MAINE. Results of the primary triangulation of the coast of New England from the northeastern boundary to the vicinity of New York (giving length and accuracy of Epping plains base, etc). Rept. 1865, app. 21,* pp. 187-203.

Bache, A. D. Notes on the measurement of a base on Epping plains, Me. Rept. 1857, app. 26,* pp. 302-305.

MARYLAND. Schott, C. A. Length of the Kent island base line. Rept. 1866, app. 8, supp., p. 140.

MASSACHUSETTS. Results of the primary triangulation of the coast of New England from the northeastern boundary to the vicinity of New York (giving length and accuracy of Massachusetts base, etc.). Rept. 1865, app. 21, pp. 187-203.

NEW YORK. Results of the primary triangulation of the coast of New England from the northeastern boundary to the vicinity of New York (giving length and accuracy of Fire island base). Rept. 1865, app. 21, pp. 187-203.

UNITED STATES. Schott, C. A. Report on the resulting length and probable uncertainty of principal base five lines, measured with the Bache-Würdemann compensation base apparatus between 1847 and 1855. Rept. 1889, app. 17, pp. 479-491.

Baldwin, A. L. On the measurement of nine base lines along the ninety-eighth meridian. Rept. 1901, app. 3, pp. 229-302.

UTAH. Eimbeck, William. Report on the measurement of the Salt lake base line. Rept. 1897, pt. 2, app. 12, pp. 753-774.

WEST VIRGINIA. Mendenhall, T. C., Mosman, A. T., Tittmann, O. H., and Woodward, R. S. On the measurement of the Holton base, Holton, Ind., and the St. Albans base, W. Va. Rept. 1892, pt. 2, app. 8, p. 329.

Schott, C. A. Length of the St. Albans base line, West Virginia, measured in 1892. Rept. 1894, pt. 2, app. 6, pp. 117-123.

*See also* Arc measures—Base measuring apparatus—Hypsometry—Reconnaissance—Triangulation.

**Base measuring apparatus.**

Description of an apparatus for measuring subsidiary base lines. Rept. 1856, app. 60, pp. 308-310.

Base apparatus. (Leaflet printed for distribution at the Pan-American exposition, Buffalo, N. Y.) Sep. pub. (1901.)

Boutelle, C. O. Apparatus for measurement of preliminary bases. Rept. 1855, app. 41, pp. 264-267.

Eimbeck, William. The duplex base apparatus and directions for its use in the field. Rept. 1897, pt. 2, app. 11, pp. 737-752.

Hilgard, J. E. Apparatus for measuring subsidiary base lines. Rept. 1857, app. 45, pp. 395-398.

——— Perfected form of the contact slide base apparatus used in the Coast survey. Rept. 1880, app. 17, pp. 341-345.

Hunt, E. B. Description of Coast survey apparatus for measuring base lines. Rept. 1854, app. 35, pp. 103-108.

——— Same. Rept. 1873, app. 12, pp. 132-136.

Jäderin, Edw. On the measurement of base lines with steel tapes and with steel and brass wires. Translated by J. H. Gore. Rept. 1893, pt. 2, app. 5, pp. 125-164.

Mendenhall, T. C., Mosman, A. T., Woodward, R. S., and Tittmann, O. H. On the measurement of the Holton base, Holton, Ripley county, Ind., and the St. Albans base, Kanawha county, W. Va. Rept. 1892, pt. 2, app. 2, pp. 53-159.

Schott, C. A. New compensation base apparatus including the determination of the length of (two) 5-metre standard bars. Rept. 1882, app. 7, pp. 107-138.

Woodward, R. S. Base apparatus. No. 2 in Bull. 29. (1893.)

*See also* Standards.

**Batchelder, John M.**

Apparatus for harbor soundings proposed by E. B. Hunt. Rept. 1858, app. 38, pp. 247, 248.

Hunt's tide meter. Rept. 1859, app. 35, pp. 365, 366.

**Batteries.** *See* Electricity.

**Bauer, Louis Agricola.**

The magnetic work of the United States Coast and geodetic survey. Rept. 1899, app. 10, pp. 939-952.

United States magnetic declination tables and isogonic charts for 1902 and principal facts relating to the earth's magnetism. Sep. pub. (1902.)

**Bay of North America.** *See* Atlantic ocean—Gulf of Maine.

**Baylor, James Bowen.**

Descriptive catalogue of publications relating to the U. S. Coast and geodetic survey, 1807-1890, and U. S. Standard of weights and measures, 1790-1890. Rept. 1891, app. 11, pp. 365-474.

(And Hazard, D. L.) General report on the magnetic survey of North Carolina, with a brief historical sketch of the fundamental phenomena of the earth's magnetism. Rept. 1899, app. 9, pp. 887-938.

**Beaches.** *See* Currents—Hydrographic surveys—Oceanography—Physical hydrography—Sea level—Shore line changes—Tides.

**Beacons.** *See* Signals.

---

* Exhausted.

**Beaufort harbor, N. C.**

Maffit, J. N. Beaufort harbor, North Carolina. Rept. 1854, app. 14,* pp. 21–23.

Rodgers, C. R. P. Resurvey of bar and anchorage at Beaufort harbor, N. C. Rept. 1857, app. 16,* p. 152, 153.

Whiting, H. L. Survey of Beaufort harbor, N. C. Rept. 1851, app. 28,* pp. 482–484.

**Bench marks.**

Description of bench marks at tidal stations. Rept. 1870, app. 10,* pp. 92–97.

Bache, A. D. Tide tables for the United States, with description of bench marks. Rept. 1853, app. 26,* pp. 67–70.

*See also* Leveling—Tides.

**Bergh, Vasili Nikolaievich.**

Journal of the first expedition of Bering, kept by Peter Chaplin. Translated by W. H. Dall. Rept. 1890, app. 19, pp. 761–770.

**Bering's expedition.**

Dall, William H. Notes on an original manuscript chart of Bering's expedition of 1725–1730 and on chart of second expedition; together with summary of a journal of the first expedition kept by Peter Chaplin and rendered into English from Bergh's Russian version. Rept. 1890, app. 19, pp. 759–774.

Schott, C. A. On the magnetic observations made during Bering's first voyage to the coasts of Kamchatka and eastern Asia in the years 1725–1730. Rept. 1891, pt. 2, app. 5, pp. 269–273.

——— Same. Bull. 20. (1891.)

**Bering sea.**

Dall, W. H. Harbors of Alaska and the tides and currents in their vicinity. Rept. 1872, app. 10,* pp. 177–212.

——— Report on the currents and temperatures of Bering sea and adjacent waters. Rept. 1880, app. 16, pp. 297–340.

Jarvis, D. H. Coast pilot notes on the Fox islands passes, Unalaska bay, Bering sea, and Arctic ocean as far as Point Barrows. Bull. 40. (1900.)

Lindenkohl, A. Problems of physiography, concerning salinity and temperature of the Pacific ocean. Rept. 1898, app. 9, pp. 463–473.

Putnam, G. R. Physical observations made in connection with the Pribilof islands survey of 1897. Rept. 1898, app. 5, pp. 233–241.

*See also* Alaska—Pribilof islands.

**Bering strait.**

Dall, W. H. Boundary line between the territory of the United States and of Russia, passing through Bering strait. Rept. 1880, app. 16,* pt. 4, sup. note, pp. 335–340.

*See also* Alaska.

**Bermudas.**

*See* Atlantic islands.

**Bessel-Bradley fundamenta.**

Powalky, C. R. New reduction of La Caille's observations, with a comparison of the results with the "Bradley-Bessel fundamenta." Rept. 1882, app. 21, pp. 469–502.

**Bessel's periodic function.**

Schott, C. A. Development of Bessel's functions for periods frequently occurring in magnetic and meteorological investigations, with examples. Rept. 1862, app. 22,* pp. 232–235.

**Bibb (steamer).**

Agassiz, L. Report upon deep-sea dredgings in the Gulf Stream during the third cruise of the U. S. S. Bibb. Rept. 1869, app. 10,* pp. 208–219.

**Bibliography.**

Hunt, E. B. Report on an index of reference to memoirs and papers on subjects related to the Coast survey operations. Rept. 1856, app. 67,* pp. 325–330.

——— On systematizing the abbreviations of titles of periodicals, transactions, etc. Rept. 1856, app. 68,* pp. 331–333.

——— Preparation of an index of scientific references. Rept. 1857, app. 51,* pp. 404–414.

*See also* Cartography—Coast and geodetic survey—Coast pilots—Hunt, E. B.—Oceanography—Phototopography—Weights and measures office.

**Bifilar traces.** *See* Magnetic intensity—Magnetic variations.

**Biography.**

Carlile P. Patterson. In memoriam. Sep. pub. (1882?.)*

Henry Wayne Blair. Tribute to the memory of. Rept. 1885, app. 18,* p. 513.

**Blair, Henry Wayne.**

(And Hilgard, J. E.) Records and results of magnetic observations made at the charge of the "Bache fund" of the National academy of sciences, from 1871 to 1876. Rept. 1882, app. 14, pp. 329–426.

Exhibit by the Coast and geodetic survey at the Southern exposition, Louisville, Ky. Rept. 1884, app. 18,* pp. 489–493.

---

* Exhausted.

**Blake (steamer).**
Agassiz, Alexander. Dredging operations by the Coast survey steamer Blake in the Caribbean sea. Rept. 1879. app. 6,* pp. 95–102.
Sigsbee, C. D. Deep sea sounding and dredging. A description and discussion of the methods and appliances used on board the Coast and geodetic survey steamer Blake. Sep. pub. (1880.)*
Pillsbury. The Gulf Stream—A description of the methods employed in the investigation and the results of the research. Rept. 1890, app. 10, pp. 459–620.
Vreeland, C. E. Description of C. & G. S. steamer Blake and her deep-sea apparatus. no. 14 in Bull. 29. (1893.)

**Blake, Theodore A.**
Geology of Alaska territory. Rept. 1867, app. 18 E,* pp. 281–290.

**Blake, William Phipps.**
Observations on the physical geography and geology of the coast of California, from Bodega bay to San Diego. Rept. 1855, app. 65,* pp. 376–398.

**Blunt, Edmund.**
Observations made on the solar eclipse of May 26, 1854. Rept. 1854, app. 40, pp. 122–127.

**Bodega bay, Cal.**
Trowbridge, W. P. Letter stating particulars relative to Bodega bay and its vicinity, and South Farallon island, California. Rept. 1855, app. 27,* pp. 185, 186.

**Bodega head, Cal.**
Davidson, George, and Schott, C. A. Comparison of the methods of determining heights by means of leveling, vertical angles and barometric measures, from observations at Bodega head and Ross mountain, Cal. Rept. 1871, app. 11,* pp. 154–170.
—— Same. Rept. 1876, app. 16, pp. 338–354.

**Bodies island base, N. C.**
Schott, C. A. Report on the resulting length and probable uncertainty of five principal base lines measured with the Bache-Würdemann compensation base apparatus between 1847 and 1855. Rept. 1889, app. 17, pp. 479–491.

**Boilers.**
Causes which lead to the explosion of a boiler on the Coast survey steamer Hetzel. Rept. 1856, app. 70,* pp. 335–340.
Hewston, J., jr. Specimens of deposit from the boiler of the Coast survey steamer Hetzel. Rept. 1853, app. 35,* pp. 89, 90.
*See also* Coal economy.

**Bond, George Phillips.**
Computations [of results] of the chronometer expeditions for determining difference of longitude between Cambridge and Liverpool. Rept. 1853, app 34,* pp. 88, 89.
Result of computations of the chronometric expeditions of 1849, 1850, and 1851. Rept. 1854, app. 42, pp. 138–142.
Results of the chronometric expeditions for difference of longitude between Cambridge, Mass., and Liverpool, England. Rept. 1856, app. 23,* pp. 182–191.

**Bond, William Cranch.**
Report in relation to the difference of longitude between the Cambridge and Liverpool observatories. Rept. 1850, app. 6,* p. 79.
On moon culminations observed by the "American method," with remarks on the performance of the spring governor. Rept. 1853, app. 32,* pp. 84–86.
Moon culminations observed by the American method. Rept. 1854, app. 37,* p. 120.
Moon culminations observed at Cambridge and the chronometric expedition for longitude difference between Cambridge, Mass., and Liverpool, England. Rept. 1855, app. 43,* pp. 275, 276.
On moon culminations and results of the chronometric expeditions between Cambridge, Mass., and Liverpool, England, for difference of longitude. Rept. 1856, app. 22,* p. 181.
Moon culminations and other phenomena. Rept. 1857, app. 28,* pp. 310, 311.

**Borden survey.**
Schott, C. A. Geographical positions of trigonometrical points in the states of Massachusetts and Rhode Island, 1835 to 1885, including those determined by the Borden survey, 1832 to 1838. Rept. 1885, app. 8, pp. 285–439.
—— Same. 2d rev. & enl. ed. Rept. 1894, pt. 2, app. 10, pp. 349–615.

**Boschke, Albert.**
Resurvey of New York bay and harbor and dependencies for the Commissioners on harbor encroachments. Rept. 1855, app. 24,* pp. 165–171.
[Comparative] maps of New York harbor. Rept. 1856, app. 48,* pp. 281, 282.
Report on the drawing of maps of New York harbor. Rept. 1857, app. 38,* pp. 373, 374.

---

*Exhausted.

**Boston harbor, Mass.**
Ferrel, William. Discussion of the tides in Boston harbor. Rept. 1868, app. 5, pp. 51–102.
——— On the moon's mass as deduced from a discussion of the tides of Boston harbor. Rept. 1870, app. 20,* pp. 190–199.
——— Meteorological effects on tides. Rept. 1871, app. 6,* pp. 93–99.

**Bottom.** *See* Dredging—Sea bottom—Shoals—Sounding.

**Boundaries.**
Report in relation to portion of boundary line in dispute between the states of Maryland and Virginia. Rept. 1890, app. 11, pp. 621–623.
Dall, W. H. Boundary line between the territory of the United States and of Russia, passing through Bering strait. Rept. 1880, app. 16,* sup. note, pp. 335–339.
Hodgkins, W. C. Historical account of the boundary line between the states of Pennsylvania and Delaware. Detailed account of work on the Pennsylvania and Delaware boundary. Rept. 1893, pt. 2, app. 8, pp. 177–222.
Sinclair, C. H. The oblique boundary line between California and Nevada. Rept. 1900, app. 3, pp. 255–484.
Whiting, H. L. Report in relation to a portion of boundary line in dispute between the states of Maryland and Virginia. Rept. 1890, app. 11, pp. 621–623.

**Boutelle, Charles Otis.**
Apparatus for measurement of preliminary bases. Rept. 1855, app. 41,* pp. 264–267.
Description of tripod and scaffold constructed and used at stations of the primary triangulation. Rept. 1855, app. 57,* pp. 361–363.
Geodetic night signals. Rept. 1880, app. 8, pp. 96–109.
On the construction of observing tripods and scaffolds. Rept. 1882, app. 10, pp. 199–208.
Short descriptions of articles forming the Coast and geodetic survey exhibit at the Cotton centennial exposition, New Orleans, La. Sep. pub. (1884.)
On geodetic reconnaissance. Rept. 1885, app. 10, pp. 469–481.

**Bowie Base, Tex.**
Baldwin, A. L. On the measurement of nine base lines along the ninety-eighth meridan. Rept. 1901, app. 3, pp. 229–302.

**Bradford, Gershom.**
Table of depths for channels and harbors, coasts of the United States. Bull. 36. (1897.)
Same. Ed. 2. Bull. 36. (1900.)

**Bradford, John Service.**
Hydrographic changes at the entrance to Cape Fear river, N. C. Rept. 1865, app. 5,* p. 45.

**Bradley-Bessel Fundamenta.**
New reduction of La Caille's observations, together with a comparison of the results with the "Bradley-Bessel Fundamenta"; also, a catalogue of the places of 150 stars south of declination —30°, for the epochs 1750 and 1830. Rept. 1882, app. 21, pp. 469–502.

**Braid, Andrew.**
Refraction on lines passing near a surface of water, from observations made at different elevations across the Potomac river. Rept. 1879, app. 16, pp. 212, 213.
Geodetic leveling on the Mississippi river. Rept. 1880, app. 11, pp. 135–144.
Hypsometry. No. 10 in Bull. 29. (1893.)

**Break circuit device.** *See* Chronograph.

**Breakwaters.** *See* Harbors—Piers.

**British Columbia.** *See* Northwest coast—Seymour narrows—Pacific coast. *See also* List of Tide tables in Part I.

**British standard yard.**
Hilgard, J. E. Comparison of American and British standard yards. Rept. 1877, app. 12, pp. 148–181.

**Bryant, Charles.**
Meteorological register, St. Paul island, Alaska, 1870–71. Rept. 1871, app. 7, pp. 100–108.

**Bucarelli bay, Alas.**
Moser, J. F. Hydrographic notes and sailing directions relating to portions of Alaska, from Dixon entrance to Yakutat bay, including reconnaissance, surveys of Cordova bay, Bucarelli bay, and Red Fish bay, 1897. Bull. 37. (1899.)

**Buffalo, N. Y.** *See* Pan-American exposition.

**Burton, Alfred Edgar.** *See* Greenland expedition.

**Buttermilk channel.** *See* New York harbor.

---

*Exhausted.

**Cadastral surveying.** *See* Hunt's interranger.

**Calais, Me.—Longitude—New Orleans, La.**

Gould, B. A. Longitude from observations by telegraph between Calais, Me., and New Orleans, La. Rept. 1862, app. 14,* pp. 158–160.

**California.**

BOUNDARY. Sinclair, C. H. The oblique boundary line between California and Nevada. Rept. 1900, app. 3, pp. 255–484.

ELEVATION. Schott, C. A. Trigonometrical determination of the heights of the stations forming the Davidson quadrilaterals, California, 1876–1882. Rept. 1884, app. 10, pp. 391–405.

GEOLOGY. Blake, W. P. Observations on the physical geography and geology of the coast of California, from Bodega bay to San Diego. Rept. 1855,* app. 65, pp. 376–398.

RECONNAISSANCE. Alden, James. Reconnaissance from San Francisco to San Diego, including Santa Barbara islands and channel. Rept. 1852, app. 18*, pp. 104–107.

McArthur, W. P. Report accompanying a reconnaissance chart of the western coast of the United States, from Monterey, Cal., to the Columbia river, Oregon. Rept. 1850, app. 31,* pp. 119–122.

TERRESTRIAL MAGNETISM. Davidson, George. Magnetic variations off the coasts of California and Mexico, observed by Spanish navigators in the last quarter of the eighteenth century. Rept. 1885, app. 7, pp. 275–284.

TIDES. Bache, A. D. Notice of earthquake waves on the western coast of the United States, December 23 and 25, 1854. Rept. 1855, app. 51,* pp. 342–346.

——— Same. Rept. 1862, app. 24,* pp. 238–241.

TOPOGRAPHY. Johnson, W. M. Topographical features of the coast adjacent to Santa Barbara channel, Cal. Rept. 1857, app. 43,* pp. 390–391.

TRIANGULATION. Schott, C. A. Results deduced from the geodetic connection of the Yolo base line with the primary triangulation of California; also, a reduction and adjustment of the Davidson quadrilaterals, forming part of that triangulation. Rept. 1885, app. 9, pp. 441–467.

*See also* Bodega bay—Bodega head—Dominguez—Humboldt bay—Lick observatory—Los Angeles—Mt. Hamilton—Mt. Santa Lucia—Pacific coast—Ross mountain—San Buenaventura—San Diego—San Francisco—Santa Barbara channel—Santa Cruz island—Sierra Nevada—South Farallon island—Tepusquet—Transcontinental arc—Trinidad bay—Ukiah—Yolo base.

**Cambridge, Mass.**

Gould, B. A. Observations of solar eclipse of July, 1860, at Cambridge, Mass. Rept. 1861, app. 21, pp. 241, 242.

——— Report on the latitude of Cloverden station, in Cambridge. Rept. 1865, app. 17,* pp. 160–165.

**Cambridge, Mass.—Longitude—Halifax, N. S.**

Walker, S. C. Arrangement with Maine telegraph co. to determine the difference of longitude between Cambridge and Halifax. Rept. 1851, app. 18,* pp. 462, 463.

**Cambridge, Mass.—Longitude—Liverpool, Eng.**

Bond, G. P. Computations [of results] of the chronometer expeditions for determining difference of longitude between Cambridge and Liverpool. Rept. 1853, app. 34,* pp. 88, 89.

——— Results of computation of the chronometric expeditions of 1849, 1850, and 1851. Rept. 1854, app. 42,* pp. 138–142.

——— Results of the chronometric expeditions of (1849, 1850, 1851, and) 1855 for difference of longitude between Cambridge, Mass., and Liverpool [England]. Rept. 1856, app. 23,* pp. 182–191.

Bond, W. C. Differences of longitude between Cambridge and Liverpool observatories. Rept. 1850, app. 6,* p. 79.

——— Moon culminations observed at Cambridge and the chronometer expedition for difference of longitude between Cambridge [Mass.] and Liverpool [England]. Rept. 1855, app. 43,* pp. 275, 276.

——— On moon culminations and results of the chronometric expeditions between Cambridge and Liverpool for difference of longitude. Rept. 1856, app. 22,* p. 181.

**Cambridge, Mass.—Longitude—Philadelphia, Pa.**

Walker, S. C. Differences of longitude of Philadelphia and Greenwich, by reduction of observations at Cambridge, Mass. Rept. 1846, app. 10,* pp. 71, 72.

**Cambridge, Mass.—Longitude—Washington, D. C.**

Difference of longitude between Harvard college observatory, Massachusetts, the Coast survey station, Seaton, and the Naval observatory, Washington, D. C., as determined by means of the electric telegraph in 1867. Rept. 1870, app. 13,* pp. 101–106.

**Camp Date creek, Ariz.** *See* Date creek camp.

**Camp Muir, Alas.** *See* Muir glacier, Alaska.

---

* Exhausted.

**Canada.**

TERRESTRIAL MAGNETISM. Schott, C. A. Magnetic declination, dip and intensity in 1859 in Sections I and II [New England and New York] and in Canada. Rept. 1859, app. 23,* p. 296.

——— Results of magnetic observations at stations in Alaska and in the Northwest territory of the Dominion of Canada. Rept. 1892, pt. 2, app. 11,* pp. 529–533.

TOPOGRAPHY. Flemer, J. A. Phototopography as practiced in Italy under the auspices of the Royal military geographical institute, and as practiced in the Dominion of Canada under the Department of the interior. Also a short historical review of other photographic surveys and publications on the subject. Rept. 1893, pt. 2, app. 3, pp. 37–116.

*See also* Alaska—Atlantic coast—British Columbia—Halifax—Labrador—Northwest coast of America—Pacific coast.

**Canals.**

Davidson, George. Observations on certain harbor and river improvements collected on a voyage from Hongkong, via Suez, to New York. Rept. 1875, app. 18,* pp. 293–314.

*See also* Ship canals.

**Cape Cod, Mass.**

Marindin, H. L. Encroachment of the sea upon the coast of Cape Cod, Mass., as shown by comparative surveys. Rept. 1889, app. 12, pp. 403–407.

——— Cross-sections of the shore of Cape Cod between Chatham and the Highland light-house. Rept. 1889, app. 13, pp. 409–457.

——— Cross sections of the shore of Cape Cod, Mass., between the Cape Cod and Long point lighthouses. Rept. 1891, pt. 2, app. 9, pp. 289–341.

Schott, C. A. Magnetic declination, dip and horizontal intensity (determined in 1860) on Cape Cod peninsula, Long Island, and New Jersey. Rept. 1860, app. 29,* p. 352.

*See also* Monomoy—Nantucket—Provincetown harbor.

**Cape Cod harbor, Mass.** *See* Provincetown harbor, Mass.

**Cape Fear river entrance, N. C.**

Bradford, J. S. Hydrographic changes at the entrance to Cape Fear river, N. C. Rept. 1865, app. 5,* p. 45.

Huger, T. B. Comparison of hydrographic surveys at the entrance to Cape Fear river. Rept. 1858, app. 13,* pp. 150, 151.

Maffitt, J. N. Examination of the bars and entrances to Cape Fear river, North Carolina. Rept. 1857, app. 17,* pp. 153–156.

**Cape Florida base, Fla.**

Gibbs, Wolcott. Examination of specimens of sand taken from the base sites at Cape Florida and Cape Sable. Rept. 1856, app. 64,* pp. 318, 319.

**Cape Sable base, Fla.**

Gibbs, Wolcott. Examination of specimens of sand taken from the base sites at Cape Florida and Cape Sable. Rept. 1856, app. 64,* pp. 318, 319.

Schott, C. A. Report on the resulting length and probable uncertainty of five principal base lines, measured with the Bache-Würdemann compensation base apparatus between 1847 and 1855. Rept. 1889, app. 17, pp. 489–491.

**Cape Verde islands.** *See* Atlantic islands.

**Capitol.** *See* Washington, D. C.

**Caribbean sea.**

Agassiz, Alexander. Dredging operations [in the Caribbean sea] by the Coast survey steamer Blake. Rept. 1879, app. 6,* pp. 95–102.

**Caroline island.**

Preston, E. D. Determinations of gravity and other observations made in connection with the solar eclipse expedition, May, 1883, to Caroline island, South Pacific ocean. Rept. 1883, app. 17,* pp. 379–381.

——— Determinations of latitude and gravity for the Hawaiian government [including a general chart of Caroline island showing gravity station of 1883]. Rept. 1888, app. 14, pp. 471–563.

**Carrollton, La.** *See* New Orleans, La.

**Cartography.** *See* List of Catalogues of maps and charts (under Administrative publications) in Part I.

*See also* Charts—Maps.

**Catalogues.** *See* Star catalogues.

**Cataloguing.** *See* Bibliography.

---

*Exhausted.

**Cat island, Miss.**

Bache, A. D. Discussion of tidal observations at Cat island. Rept. 1851, app. 7,* pp. 127–136.

——— Same. Rept. 1866, app. 18,* pp. 113–119.

——— Discussion of tidal observations at Cat island in the Gulf of Mexico. Rept. 1852, app. 22,* pp. 111–122.

Hilgard, J. E. Method (of using the transit instrument for) of observing azimuth employed at Cat island. Rept. 1856, app. 27,* pp. 208, 209.

Dean, G. W. Effect of the wind on the height of the water in Cat island harbor, Miss. Rept. 1856, app. 45,* pp. 276–278.

*See also* Gulf Stream.

**Catalogues.** *See* Bibliography.

*See also* List of Catalogues of maps and charts in Part I.

**Cauchy's formulæ.**

Cauchy's interpolation formulæ, with remarks by C. A. Schott. Rept. 1860, app. 37,* pp, 392–396.

**Cedar keys harbor, Fla.**

Gerdes, F. H. Florida coast reconnaissance. Rept. 1851, app. 31, pp. 488–494.

**Centennial exposition of the Ohio valley and central states.**

Boutelle, C. O. Short descriptions of articles forming the Coast and geodetic survey exhibit at the Centennial exposition of the Ohio valley and central states. Sep. pub. (1888.)

**Central Pacific railroad.** *See* Summit, Wyo.

**Channels.**

CALIFORNIA. Mitchell, Henry. On the probable effect of extended piers in modifying the channel facilities of San Francisco bay near Yerba Buena island. Rept. 1870, app. 18,* pp. 180, 181.

SOUTH CAROLINA. Maffitt, J. N. Comparative chart of Maffitt's channel, Charleston harbor. Rept. 1855, app. 15,* pp. 155–157.

*See also* Depths—Harbors—Hydrographic surveys—Physical hydrography—Sounding—Tides

**Chaplin, Peter.**

Notes on an original manuscript chart of Bering's expedition of 1725–30, and on an original manuscript chart of his second expedition; together with a summary of a journal of the first expedition, kept by Peter Chaplin, and now first rendered into English from Bergh's Russian version by W. H. Dall. Rept. 1890, app. 19, pp. 761–770.

**Charleston harbor, S. C.**

Maffitt, J. N. Comparative chart of Maffitt's channel, Charleston harbor. Rept. 1885, app. 15,* pp. 155–157.

**Charleston, S. C.—Longitude—Washington, D. C.**

Gould, B. A. Results of observations for the determination of difference of longitude by telegraph between Seaton station, Washington, D. C., and Charleston, S. C. Rept. 1853, app. 33,* pp. 86–88.

**Charts.**

Chart publications. (Leaflet printed for distribution at the Pan-American exposition, Buffalo, N. Y.) Sep. pub. (1901.)

Information concerning [sets of] U. S. Coast and geodetic survey charts. Notice to mariners. 118. (1889.)

List of Coast survey maps, sketches, and preliminary charts, engraved and engraving. Rept. 1851, app. 11,* pp. 160–162.

Dall, W. H. Notes on the original manuscript chart of Bering's expedition of 1725–30, and on an original manuscript of his second expedition: together with a summary of a journal of the first expedition, kept by Peter Chaplin, and now first rendered into English from Bergh's Russian version. Rept. 1890, app. 19, pp. 759–774.

Ogden, H. G. Chart publications. No. 11 in Bull. 29. (1893.)

Schott, C. A. The value of the "Arcano del Mare," with reference to magnetic declination in the seventeenth century. Rept. 1888, app. 6,* pt. 1, pp. 167–170.

Wainwright, D. B. Notes relative to the use of charts issued by the United States Coast and geodetic survey. Sp. pub. 6. (1900.)

*See also* Drawing—Electrotyping—Engraving—Lithography—Maps—Paper—Photography—Printing—Projection.

**Chatham, Mass.**

Mitchell, H. Changes in the neighborhood of Chatham and Monomoy. Rept. 1873, app. 9,* pp. 103–107.

*See also* Monomy.

**Chatham island.**

Smith, Edwin. Transit of Venus, Chatham island, 1874. Rept. 1875, app. 14,* pp. 231–248.

---

* Exhausted.

**Chatham strait, Alas.**
Rodman, Hugh (compiler). Alaska. General information relating to the vicinity of Chatham and Peril straits, and Cooks inlet and the region to the Westward. Bull. 35. (1897.)
——— Same. Title changed to Compilation of the most recent information relative to the harbors, anchorages, and dangers to navigation in the vicinity of Chatham and Peril straits and Cooks inlet, Alaska. Rept. 1896, pt. 2, app. 11, pp. 373–393.

**Chemiglyphy.** *See* Etching.

**Chesapeake bay.**
Bache, A. D., Pourtales, L. F., and Schott, C. A. Tides, currents, magnetic variations, and geographic positions of light-houses. Chesapeake bay and its rivers. Sep. pub. (1861.)*
Collins, Frederick. Density of the waters of the Chesapeake bay and its principal estuaries. Rept. 1877, app. 14, pp. 184–190.
*See also* Pocomoke sound—Tangier sound.

**Chesapeake-Pamplico arc.**
Schott, C. A. The Pamplico-Chesapeake arc of the meridian and its combination with the Nantucket and the Peruvian arcs for a determination of the figure of the earth from American measures. Rept. 1877, app. 6, pp. 84–95.

**Chicago, Ill.** *See* World's columbian exposition.

**Christie, Alexander S.**
Comparison of the predicted with the observed times and heights of high and low water at Sandy Hook, N. J., during 1889. Rept. 1890, app. 15,* p. 705–714.
(And Haskell, E. E.) Tides and currents. No. 9 in Bull. 29. (1893.)

**Chronograph.**
Eimbeck, William. Improvement on the Hipp chronograph. Rept. 1872, app. 18, pp. 266, 267.
Mitchel, O. M. Mechanical record of astronomical observations. Rept. 1849, app. 5,* pp. 72–78.
Schott, C. A. Determination of weights to be given to observations for determining time with portable transit instrument, recorded by the chronographic method. Rept. 1872, app. 12, pp. 222–226.
*See also* Azimuth—Gravity—Longitude—Spring governor—Time.

**Chronometer.** *See* Azimuth—Chronograph—Gravity—Longitude—Time.

**Cincinnati, Ohio.** *See* Centennial exposition.

**Cincinnati, Ohio—Levels—Gibraltar, Mich.**
Ferguson, O. W. Resulting elevations from spirit leveling between Gibraltar, Mich., and Cincinnati, Ohio, from observations by O. W. Ferguson, assistant, between June 3 and November 28, 1899. Rept. 1899, app. 7, pp. 321–345.

**Circular functions.** *See* Logarithms.

**Circumpolar stars.** *See* Stars.

**Clarke's spheroid.** *See* Projection.

**Clay.**
Little, George. Blue clay of the Mississippi river. Rept. 1880, app. 12, pp. 145–171.

**Climate.**
Totten, James. Climate, soil, and general character of Florida keys. Rept. 1853, app. 18,* pp. 50, 51.

**Clocks.** *See* Chronograph—Longitude.

**Cloverden Station, Mass.** *See* Cambridge, Mass.

**Coal economy.**
Emery, Charles E. Economy in coal as exemplified by the action of compound engines in the steamer Hassler. Rept. 1874, app. 13,* pp. 148–151.

**Coast and geodetic survey.**
Coast and geodetic survey. (Leaflet printed for distribution at the Pan-American exposition at Buffalo, N. Y.) Sep. pub. (1901.)
The methods and results of the U. S. Coast and geodetic survey as illustrated at the World's columbian exposition, 1893. Bull. 29 (1893).
Mendenhall, T. C. Coast and geodetic survey. No. 1 in Bull. 29. (1893.)
Pritchett, H. S. General statement of the administration and work of the Coast and geodetic survey, with historical sketch from 1807 to 1898. Sep. pub. (1899.)
Trowbridge, W. P. Origin, cost, and progress of foreign geodetic surveys with other data for comparison with the results of the United States Coast survey. Rept. 1858, app. 40,* pp. 251–270.

---

* Exhausted.

Trowbridge, W. P. Comparison of the cost and progress of the United States Coast survey from 1832 to 1844 and 1844 to 1856–57. Rept. 1858, app. 41,* pp. 270–273.

ACCOUNTING. *See* List of Laws and regulations in Part I (Administrative publications).

ARCHIVES. List of original topographic and hydrographic sheets, geographically arranged, registered in the archives of the United States Coast and geodetic survey, from January, 1834, to December 31, 1895. Rept. 1895, pt. 2, app. 11, pp. 399–516.

BIBLIOGRAPHY. Recent publications. Bull. 1. (1888.)

Baylor, J. B. Descriptive catalogue of publications relating to the U. S. Coast and geodetic survey, 1807–1890, and to U. S. Standard weights and measures, 1790 to 1890. Rept. 1891, pt. 2, app. 11, pp. 365–474.

——— Descriptive catalogue of publications relating to the U. S. Coast and geodetic survey, 1807–1896, and to U. S. Standard weights and measures, 1790 to 1896. Sp. pub. 2.* (1898.)

Goodfellow, E. General index of professional and scientific papers contained in the United States Coast survey reports from 1851 to 1870. Rept. 1871, app. 17,* pp. 193–209.

——— Descriptive catalogue of publications relating to the Coast and geodetic survey and to Standard measures. Rept. 1883, app. 6, pp. 121–135.

——— General index to the progress sketches and illustrations, maps, and charts published in the Annual reports of the U. S. Coast survey and U. S. Coast and geodetic survey from 1844 to 1885, inclusive. Rept. 1887, app. 12,* pp. 217–268.

Hunt, E. B. Consolidated alphabetical index of the ten annual Coast survey reports from 1844 to 1853, inclusive [including sketches]. Rept. 1854 [no app. number], pp. 280–288.*

Nes, F. F. Consolidated alphabetical index of the ten annual Coast survey reports, from 1854 to 1863, inclusive [including sketches]. Rept. 1864, pp. 227–315.

Sinclair, C. H. General index of scientific papers, methods, and results contained in the appendices of the annual reports of the United States Coast and geodetic survey, from 1845 to 1880, inclusive. Rept. 1881, app. 6,* pp. 91–123.

CARTOGRAPHY. Information concerning [sets of] U. S. Coast and geodetic survey charts. Notice to mariners 118. (1889.)

*See also* List of Catalogues of maps and charts in Part I.

EMPLOYEES. *See* List of Official reports of expenditures and of persons employed in Part I (Administrative publications).

ESTIMATES. *See* List of Reports submitting estimates in Part I (Administrative publications).

EXHIBITS. The methods and results of the U. S. Coast and geodetic survey as illustrated at the World's columbian exposition, 1893. Bull. 29. (1893.)

Blair, H. W. Exhibit by the Coast and geodetic survey at the Southern exposition, Louisville, Ky. Rept. 1884, app. 18,* pp. 489–493.

Boutelle, C. O. Short descriptions of articles forming the Coast and geodetic survey exhibit at the Cotton centennial exposition, New Orleans, La., 1884–85. Sep. pub. (1884.)*

——— Short descriptions of articles forming the Coast and geodetic survey exhibit at the Centennial exposition of the Ohio valley and central states, Cincinnati, Ohio, 1888. Sep. pub. (1888.)*

Wainwright, D. B. Preparation and arrangement of the exhibit of the U. S. Coast and geodetic survey at the World's columbian exposition, 1893. Rept. 1893, pt. 2, app. 10, pp. 425–439.

EXPENDITURES. Special report on the comparative progress and expenditure of the Coast survey, in different years. Foreign surveys, etc. Sep. pub. (1858.)*

*See also* List of Official reports of expenditures and of persons employed in Part I (Administrative publications).

HISTORY. Historical sketch of the U. S. Coast and geodetic survey. Sep. pub. (1884.)

Historical compilation, U. S. Coast and geodetic survey. Sep. pub. (1887.)*

Schott, C. A. Historical review of the work of the Coast and geodetic survey in connection with terrestrial magnetism. Rept. 1888, app. 6,* pt. 2, pp. 171–176.

——— Same. Bull. 7. (1888.)

INSTRUCTIONS. *See* List of Instructions in methods of work in Part I (Administration publications).

LAWS AND REGULATIONS. Regulations for enlistments, discharges, etc. Laws and regulations. (1899.)

Rules governing routine and discipline aboard ship. Laws and regulations. (1899.)

*See also* List of Laws and regulations in Part I (Administration publications).

ORGANIZATION. Laws relating to the survey of the coast of the United States, with the plan of reorganization of 1843, and regulations by the Treasury department. Laws and regulations. (1858.)

Statutes relating to the survey of the coast of the United States, with the plan of reorganization of 1843, and regulations by the Treasury department. Laws and regulations. (1869.)

Letter of the Superintendent on the proposed transfer to the Navy department. Sep. pub. (1883.)*

STEAMERS. *See* Bibb—Blake—Hassler—Hetzel.

*See also* Weights and measures office.

**Coast features.**

Agassiz, Louis. Relation of geological and zoological researches to general interests in the development of coast features. Rept. 1867, app. 17,* pp. 183–186.

Bache, A. D. On the heights of the tides of the Atlantic coast of the United States [relative to configuration of the coast]. Rept. 1857, app. 33,* pp. 342–347.

*See also* Shore line changes.

---

* Exhausted.

**Coast pilot.**

Coast pilot. (Leaflet printed for distribution at the Pan-American exposition, Buffalo, N. Y.) Sep. pub. (1901.)

Catalogue of sailing directions, list of dangers, etc., prepared for publication under the direction of the Superintendent. Rept. 1855, app. 30,* pp. 193–200.

Ferrel, Wm. Meteorological researches for the use of the Coast pilot. Rept. 1875, app. 20,* pp. 369–412.

——— Meteorological researches for the use of the Coast pilot. Rept. 1878, app. 10,* pp. 175–267.

——— Meteorological researches, Part III.—Barometric hypsometry and reduction of the barometer to sea level. Rept. 1881, app. 10, pp. 225–268.

ALASKA. Notes on dangers in Neva and Peril straits and anchorages in Fish bay, southeast Alaska. Notice to mariners 46. (1884.)

Sailing directions for Wrangell strait, Alaska. Notice to mariners 60. (1885.)

Sailing directions for inland passage between Sitka harbor and Hooniah sound, through Olga strait, Neva strait, and Peril strait, Alaska. Notice to mariners 61. (1885.)

Davidson, George. Coast features and resources of Alaska territory. Rept. 1867, app. 18,* pp. 187–329.

Jarvis, D. H. Coast pilot notes on the Fox islands passes, Unalaska bay, Bering sea, and Arctic ocean as far as Point Barrow. Bull. 40. (1900.)

Moser, J. F. Hydrographic notes and sailing directions relating to portions of Alaska from Dixon entrance to Yakutat bay, including reconnaissance surveys of Cordova bay, Bucarelli bay, and Red Fish bay, 1897. Bull. 37. (1899.)

——— Hydrographic notes, sailing directions, and charts of surveys relating to the vicinity of Prince William sound, Cooks inlet, Kadiak island, and route from Unalaska to Chignik, through Unimak pass and inside the islands, 1897. Bull. 38. (1899.)

Rodman, Hugh. Compilation of the most recent information relative to the harbors, anchorages, and dangers to navigation in the vicinity of Chatham and Peril straits and Cooks inlet, Alaska. Bull. 35. (1896.)

——— Same. Rept. 1896, pt. 2, app. 11, pp. 373–393.

CALIFORNIA. Trowbridge, W. P. Bodega bay and South Farallon island, California. Rept. 1855, app. 27,* pp. 185, 186.

Johnson, W. M. Features of Santa Cruz island, the valley of San Buenaventura, and the coast north of Santa Barbara channel. Rept. 1855, app. 28,* pp. 186–188.

NEW YORK. Coast currents approaching Sandy Hook. Notice to mariners 97. (1888.)

——— Changes in the pilotage laws of the port of New York. Notice to mariners 53. (1884.)

TEXAS. Greenwell, W. E. General features and peculiarities of the coast of lower Texas, with suggestions in regard to facilities for navigation. Rept. 1854, app. 21,* pp. 30, 31.

UNITED STATES. Bache, A. D. Sailing directions to accompany the new chart of the western coast of the United States. Sep. pub. (1850.)*

——— Notices of the western coast of the United States. Sep. pub. (1851.)*

Davidson, George. Descriptive report of localities on the western coast from the north entrance of Rosario strait, Washington territory, to the southern boundary of California. Rept. 1855, app. 26,* pp. 176–185.

——— Directory for the Pacific coast of the United States. Rept. 1858, app. 44,* pp. 297–458.

——— Same. Rept. 1862, app. 39,* pp. 268–430.

WASHINGTON. Alden, James. The coast, harbors and commerce of Washington territory. Rept. 1855, app. 29,* pp. 188–192.

*See also* Charts—Compass—Currents—Geographic names—Hydrographic surveys—Light-houses—Magnetic declination—Meteorology—Oceanography—Physical hydrography—Piers—Pilotage—Sounding—Tides. *See also* Coast Pilots in Part I.

**Collins, Frederick.**

Density of the waters of the Chesapeake bay and its principal estuaries. Rept. 1877, app. 14, pp. 184–190.

**Colombia.** *See also* Panama—Darien.

**Colonna, Benjamin A.**

Transit of Mercury, Summit station, Central Pacific railroad. Rept. 1878, app. 6, pp. 81–87.

——— Transit of Venus of December 6, 1882, at Washington, D. C. Rept. 1883, app. 16, pp. 373–375.

Currents of New York bay and harbor from the notes of a physical survey by H. L. Marindin, assistant. Bull. 8. (1889.)

**Colorado.**

Schott, C. A. Resulting heights from spirit leveling between Ellis, Kans. and Hugo, Col. Rept. 1898, app. 2, pp. 195–214.

Winston, Isaac. Resulting elevations from spirit leveling between Denver, Col. and Rock Creek, Wyo. Rept. 1899, app. 5, pp. 283–298.

*See also* Transcontinental arc.

**Colorado Springs, Colo.—Levels—Hugo, Colo.**

Schott, C. A. Resulting heights from spirit leveling between Hugo and Colorado Springs, Col., 1898. Rept. 1898, app. 3, pp. 215–228.

---

*Exhausted.

**Columbia, S. C.—Longitude—Macon, Ga.**
Gould, B. A. Telegraphic operations for differences of longitude between Columbia, S. C. and Macon, Ga. Rept. 1855, app. 46,* pp. 286–295.

**Columbia, S. C.—Longitude—Raleigh, N. C.**
Gould, B. A. On telegraphic observations for the difference of longitude between Raleigh, N. C. and Columbia, S. C. Rept. 1854, app. 41,* pp. 128–131.

**Columbia, S. C.—Longitude—Wilmington, N. C.**
Gould, B. A. Progress made in telegraph campaigns for difference in longitude and the preparation of results for publication. Rept. 1857, app. 27,* pp. 305–310.

**Columbia River.**
Hergesheimer, E. Type forms of topography Columbia river. Rept. 1881, app. 7, pp. 124, 125.

**Columbus.**
Fox, G. V. An attempt to solve the problem of the first landing place of Columbus in the New world. Rept. 1880, app. 18, pp. 346–411.
Schott, C. A. Variation of the compass off the Bahama islands at the time of the landfall of Columbus in 1492. Rept. 1880, app. 19, pp. 412–417.

**Compass.** *See* Magnetic needle—Magnetic declination.

**Compass deviation.**
Gillmore, J. C. (compiler). Magnetic ranges for determining the deviation of the compass, with short explanations of how to find the deviation and error of the compass, in the Bay of San Francisco, Cal. Sp. pub. 1. (1898.)

**Computation.** *See* Tables to facilitate computation.

**Coney Island, N. Y.** *See* Long Island—New York harbor.

**Conferences.** *See* Geodetic conference—Gravity—International geodetic association—Topographical conference.

**Congress map.**
Tidball, J. C. Description of the Congress map. Rept. 1854, app. 32,* pp. 61–63.
——— Same. Rept. 1855, app. 39,* pp. 253–255.

**Connecticut.**
GEOGRAPHIC POSITIONS. Schott, C. A. Geographical positions of trigonometrical points in the state of Connecticut, determined by the U. S. Coast and geodetic survey, 1833 to 1886. Rept. 1888, app. 8, pp. 313–403.
TERRESTRIAL MAGNETISM. Schott, C. A., and Dean, G. W. Results from observations for magnetic declination, dip, and intensity in Maine and Connecticut, including also a station in the District of Columbia. Rept. 1863, app. 22,* p. 204.
TRIANGULATION. Results of the primary triangulation of the coast of New England, from the northeastern boundary to the vicinity of New York. Rept. 1865, app. 21,* pp. 187–203.
*See also* Atlantic ocean—Eastern oblique arc—Hudson river—Long Island sound—New England.

**Constellations.** *See* Pleiades—Scorpio.

**Constitution of the Earth.**
Peirce, Benjamin. Internal constitution of the earth. Rept. 1879, app. 14, p. 201.

**Contours.**
Schott, C. A. Height in feet corresponding to a given angle of elevation and a given distance in metres, for use in the construction of contour lines by the plane table. Rept. 1860, app. 38,* p. 397.
Whiting, H. L. Topographical contour, hydrographic details, and reduction, on photography and on the scale of shades suitable for complete maps. Rept. 1860, app. 20, pp. 216–229.
*See also* Topography.

**Contraction of paper.** *See* Paper.

**Cooks inlet, Alas.**
Moser, J. F. Hydrographic notes, sailing directions, and charts of surveys relating to the vicinity of Prince William sound, Cook inlet, Kadiak island, and route from Unalaska to Chignik, through Unimak pass and inside the islands. Bull. 38. (1899.)
Rodman, Hugh (compiler). General information relating to the vicinity of Chatham and Peril straits, from a recent survey by the U. S. Coast survey steamer Patterson, Lieut. Commander E. K. Moore, U. S. N., commanding, and [from notes on] Cooks inlet and the region of the westward, by W. H. Dall, U. S. Geological survey. Bull. 35. (1896.)
——— Same. Title changed to Compilation of the most recent information relative to the harbors, anchorages, and dangers to navigation in the vicinity of Chatham and Peril straits and Cooks inlet, Alaska. Rept. 1896, pt. 2, app. 11, pp. 373–393.

**Cook, Mt., Alas.** *See* Mt. Cook.

---

* Exhausted.

**Coos bay, Ore.**
Lawson, J. S. General character of Koos bay, Oregon. Rept. 1861, app. 30,* pp. 264, 265.

**Coral reefs.** *See* Florida reefs.

**Cordova bay, Alas.**
Moser, J. F. Hydrographic notes and sailing directions relating to portions of Alaska from Dixon entrance to Yakutat bay, including reconnaissance surveys of Cordova bay, Bucarelli bay, and Red Fish bay, 1897. Bull. 37. (1899.)

**Corinth, Miss.—Levels—Memphis, Tenn.**
Schott, C. A. On the results of spirit leveling of precision between Corinth, Miss., and Memphis, Tenn., 1890 and 1891. Rept. 1892, pt. 2, app. 4, pp. 205–224.

**Corona.** *See* Eclipse.

**Cotidal lines.**
Bache, A. D. Preliminary determinations of cotidal lines on the Atlantic coast of the United States, from Coast survey observations. Rept. 1854, app. 45,* pp. 147–152.
——— Cotidal lines of the Pacific coast. Rept. 1855, app. 50,* pp. 338–342.
——— Approximate cotidal lines of diurnal and semi-diurnal tides of the coast of the United States on the Gulf of Mexico; discussion and preliminary determinations. Rept. 1856, app. 35,* pp. 252–260.
——— Additional researches on cotidal lines of the Gulf of Mexico. Rept. 1862, app. 9,* pp. 126–128.
Harris, R. A. Manual of Tides [reproduction of principal cotidal charts] Part IVa. Rept. 1900, app. 7, p. 677.
Peirce, B. Cotidal lines of an inclosed sea, derived from the equilibrium theory. Rept. 1858, app. 30,* pp. 210–213.
*See also* Tides.

**Cotton centennial exposition.**
Boutelle, C. O., compiler. Short descriptions of articles forming the Coast and geodetic survey exhibit at the Cotton centennial exposition, New Orleans, La., 1884. Sep. pub. (1884.)*

**Craig, Thomas.**
General properties of the equations of steady motion. Sep. pub. (1882.)*
A treatise on projections. Sep. pub. (1882.)

**Cram, T. J.**
Reports on measurement of heights. Rept. 1854, app. 34,* pp. 95–103.

**Craven, T. Augustus.**
Specimen box for bringing up the bottom in deep sea soundings. Rept. 1854, app. 54,* p. 191, 192.

**Crillon, Mt., Alas.** *See* Mt. Crillon.

**Cruises.** *See* Voyages.

**Cubitt's gap, La.**
Marindin, H. L. Comparison of surveys of Mississippi river in the vicinity of Cubitt's gap. Rept. 1880, app. 10, pp. 126–134.
*See also* Mississippi river.

**Culminations.**
Schott, C. A. Approximate times of culminations and elongations and of the azimuths at elongation of Polaris for the years between 1889 and 1910. Bull. 14. (1890.)
——— Same. Rept. 1891, pt. 2, app. 1, pp. 7–13.
*See also* Moon culminations.

**Current float.**
Apparatus for observing currents in connection with the physical survey of the Mississippi river. Rept. 1877, app. 9, pp. 104–107.
Patterson, C. P. Description of a float for observations of surface currents. Rept. 1849, app. 20,* p. 97.

**Current meter.**
Haskell, E. E. On observations of currents with the direction-current meter in the Straits of Florida and in the Gulf of Mexico, 1891. Rept. 1891, pt. 2, app. 10, pp. 343–364.
Mitchell, H. Physical survey of New York harbor and the coast of Long Island with descriptions of apparatus for observing currents. Rept. 1859, app. 26,* pp. 311–317.
——— Physical survey of the Delaware river at Philadelphia. Rept. 1878, app. 9, pp. 121–173.

**Currents (tidal and oceanic).**
Bache, A. D. Method used in the Coast survey of showing current observations. Rept. 1851, app. 8,* pp. 136, 137.
Christie, A. S., and Haskell, E. E. Tides and currents. No. 9 in Bull. 29. (1893.)

---

* Exhausted.

Hayford, John F. On the use of observations of currents for prediction purposes. Rept. 1890, app. 14, pp. 691–703.

Hunt, E. B. Dynamics of ocean currents. Rept. 1858, app. 31,* pp. 213–216.

ALASKA. Dall, W. H. Harbors of Alaska and the tides and currents in their vicinity. Rept. 1872, app. 10,* pp. 177–212.

——— Geographical and hydrographical explorations on the coast of Alaska. Rept. 1873, app. 11,* pp. 111–122.

ATLANTIC OCEAN. Off-shore current observations. Notice to mariners 114. (1889.)

Current bottle, Mobile bay to Mosquito inlet and Cape Florida to Jupiter inlet. Rept. 1854, app. 52,* pp. 189, 190.

Copy of card in current bottle thrown over near Sandy Hook and picked up on the bar at Santa Cruz, one of the Western islands [of the Azores]. Rept. 1855, app. 54,* p. 359.

Libby, William, jr. Relations of cold and warm ocean currents off the New England coast, by the U. S. Fish commission, with the cooperation of the U. S. Coast and geodetic survey. Rept. 1891, pt. 2, app. 7,* pp. 279–281.

BERING SEA. Dall, W. H. Report on the currents and temperatures of Bering sea. Rept. 1880, app. 16,* pp. 297–340.

CHESAPEAKE BAY. Bache, A. D., Pourtales, L. F., and Schott, C. A. Tides, currents, magnetic variation and geographical positions of light-houses. Chesapeake bay and its rivers. Sep. pub. (1861.)*

DELAWARE BAY AND RIVER. Mitchell, Henry. New rule for currents in Delaware bay and river. Rept. 1881, app. 18,* pp. 464–469.

FLORIDA. Gerdes, F. H. Florida coast reconnaissance. Rept. 1851, app. 31,* pp. 488–494.

GULF STREAM. Current bottle, Mobile bay to Mosquito inlet and Cape Florida to Jupiter inlet. Rept. 1854, app. 52,* pp. 189, 190.

Copy of cards from current bottle thrown over south of Mississippi delta. Rept. 1856, app. 46,* pp. 279, 280.

Circulars found in current bottles thrown from the surveying steamer Corwin and picked up in the vicinity of the Florida reef. Rept. 1859, app. 28,* pp. 320, 321.

Velocity and direction of the Gulf Stream between Fowey rocks, Florida, and Gun Cay, Bahamas. Notice to mariners 78. (1886.)

Gulf Stream currents. Notice to mariners 94. (1887.)

Gerdes, F. H. Extract from a letter upon the change of the magnetic variation within short distances in the Gulf of Mexico. Rept. 1845, app. 3,* pp. 41–43.

Haskell, E. E. On observations of currents with the direction current-meter in the straits of Florida and in the Gulf of Mexico, 1891. Rept. 1891, pt. 2, app. 10, pp. 343–364.

Pillsbury, J. E. Report on deep-sea current work in the Gulf Stream. Rept. 1885, app. 14, pp. 495–501.

——— A report of Gulf Stream explorations.—Observations of currents, 1886. Rept. 1886, app. 11, pp. 281–290.

——— Gulf Stream explorations; observations of currents, 1887. Rept. 1887, app. 8, pp. 173–184.

——— Gulf Stream explorations.—Observations of currents, 1888–1889. Rept. 1889, app. 16, pp. 467–477.

LONG ISLAND SOUND. Schott, C. A. Tidal currents of Long Island sound and approaches. Rept. 1854, app. 50,* pp. 168–179.

MASSACHUSETTS. Marindin, H. L. Tides and currents in the harbor of Edgartown and in Katama bay, Martha's vineyard. Rept. 1892, pt. 2, app. 5, pp. 225–241.

Mitchell, H. Tides and currents in Nantucket and in Martha's Vineyard sounds and in East river at Hell Gate. Rept. 1857, app. 35,* pp. 350–354.

——— On the movements of the sands at the eastern entrance to Vineyard sound. Rept. 1887, app. 6, pp. 159–163.

Schott, C. A. On the currents of Nantucket shoals. Rept. 1854, app. 48,* pp. 161–166.

——— Currents in Muskeget channel and off the northeast coast of Martha's Vineyard. Rept. 1854, app. 49,* pp. 166–168.

MISSISSIPPI RIVER. Marindin, H. L. Apparatus for observing currents in connection with the physical survey of the Mississippi river. Rept. 1877, app. 9, pp. 104–107.

NEW ENGLAND COAST. Libby, William. Relations of cold and warm water currents off the New England coast, by the U. S. Fish commission, with the co-operation of the U. S. Coast and geodetic survey. Rept. 1891, pt. 2, app. 7,* pp. 279–281.

NEW YORK HARBOR AND APPROACHES. Coast currents approaching Sandy Hook. Notice to mariners 97. (1888.)

Bache, A. D. Tidal currents of New York harbor near Sandy Hook. Rept. 1858, app. 27,* pp. 197–203.

Colonna, B. A. Currents of New York bay and harbor from the notes of a physical survey by H. L. Marindin. Bull. 8. (1889.)

Marindin, H. L. Tide levels and flow of currents in New York bay and harbor. Rept. 1888, app. 9, pp. 405–408.

——— Same, abstract. Bull. 3. (1888.)

Mitchell, H. Tides and tidal currents of New York harbor and its dependencies. Rept. 1856, app. 39,* pp. 264–266.

---

* Exhausted.

Mitchell, H. Tides and currents in Nantucket and Martha's Vineyard sounds and in East river at Hell Gate with remarks on the revision of levelings on the Hudson river. Rept. 1857, app. 35,* pp. 350–354.

——— Currents in the East river at Hell Gate and Throg's Neck, the subcurrents of New York bay and harbor and levelings on the banks of the Hudson river. Rept. 1858, app. 28, pp. 204–207.

——— Tides and currents of Hell Gate, N. Y. Rept. 1867, app. 13,* pp. 158–169.

——— Harbor of New York, 1873. Rept. 1871, app. 8,* pp. 109–133.

——— Middle-ground shoal, New York harbor. Rept. 1872, app. 16,* pp. 257–261.

——— Circulation of the sea through New York harbor. Rept. 1886, app. 13, pp. 409–432.

——— Report on the physical surveys of New York harbor. Rept. 1887, app. 15, pp. 301–311.

PACIFIC OCEAN. Dall, W. H. Geographical and hydrographical explorations on the coast of Alaska. Rept. 1873, app. 11,* pp. 111–122.

——— Report on the currents and temperatures of Bering sea and adjacent waters. Rept. 1880, app. 16,* pp. 297–340.

*See also* Hydrographic surveys—Oceanography—Physical hydrography—Sounding—Tides.

**Cutts, Richard Dominicus.**

Observations on the solar eclipse of May 26, 1854, at Block mountain, Cal. Rept. 1854, app. 40, pp. 125–127.

Memoranda relating to the field work of the secondary triangulation. Rept. 1868, app. 7,* pp. 109–139.

Report of observations of the eclipse of the sun on August 7, 1869, made by a party at Bristol, Tenn., in charge of R. D. Cutts. Rept. 1869, app. 8, pp. 117–124.

Leveling operations between Keyport, on Raritan bay, and Gloucester, on the Delaware river, to determine the heights above mean tide of the primary stations Beacon hill, Disboro, Stony hill, Mount Holly, and Pine hill. Rept. 1870, app. 7,* pp. 75, 76.

Barometrical observations made in connection with the line of spirit leveling from Raritan bay to the Delaware river to determine the heights above mean tide of the primary stations. Rept. 1870, app. 8,* pp. 77–89.

Leveling operations between Keyport, on Raritan bay, and Gloucester, on the Delaware river, to determine the height above mean tide of the primary stations Beacon hill, Disboro, Stony hill, Mount Holly, and Pine hill. [Ed. 2.] Rept. 1871, app. 12,* pp. 171–175.

(And Young, C. A.) Astronomical and meteorological observations made at Sherman, Wyo. T. Rept. 1872, app. 8,* pp. 75–172.

Methods, discussions and results. Field work of the triangulation. Sep. pub. (1877).

Field work of the triangulation. Rept. 1882, app. 9,* pp. 151–197.

**Cyclones.**

Ferrel, William. Meteorological researches for the use of the Coast pilot. Part II. On cyclones, waterspouts and tornadoes. Rept. 1878, app. 10,* pp. 175–267.

**Dall, William Healey.**

Harbors of Alaska and the tides and currents in their vicinity. Rept. 1872, app. 10,* pp. 177–212.

Geographical and hydrographical explorations on the coast of Alaska. Rept. 1873, app. 11,* pp. 111–122.

Mount St. Elias, Mount Fairweather, and some of the adjacent mountains (Alaska). Rept. 1875, app. 10,* pp. 157–188.

Meteorology and bibliography, app. 1, Coast pilot of Alaska. Pacific Coast pilot. 1879.*

Report on the currents and temperatures of Bering sea. Rept. 1880, app. 16,* pp. 297–340.

Coast from Dixon entrance to Yakutat bay, Alaska. Part I. Pacific Coast pilot. 1883.*

Notes on an original manuscript chart of Bering's expedition of 1725–30, and on an original manuscript chart of his second expedition; together with a summary of a journal of the first expedition, kept by Peter Chaplin, and first rendered into English from Bergh's Russian version. Rept. 1890, app. 19, pp. 7 9–774.

**Dams.**

Mitchell. H. Reclamation of tide lands and its relation to navigation. Rept. 1869, app. 5, pp. 75–104.

**Dangers to navigation.** *See* List of Coast pilots and of Notices to mariners in Part I.

**Darien, Isthmus of.**

Davidson, G. Condensed account of M. Hellert's explorations on the Isthmus of Panama, including his special explorations on the Isthmus of Darien, with suggestions for conducting a future survey. Rept. 1868, app. 15,* pp. 260–277.

Mitchell, H. Terminals of the proposed canals through Nicaragua and the Isthmus of Darien. Rept. 1874, app. 12, pp. 135–147.

**Date creek camp, Ariz.**

Schott, C. A. Observations for daily variation of the magnetic declination made at Fort Steilacoom, Washington territory, in 1866, and at Camp date creek, in Arizona, in 1867. Rept. 1870, app. 15,* pp. 111–114.

---

* Exhausted.

**Dauphin island base, Ala.**

Schott, C. A. Report on the resulting length and probable uncertainty of five principal base lines, measured with the Bache-Würdemann compensation base apparatus between 1847 and 1855. Rept. 1889, app. 17, pp. 479–491.

**Davidson, George.**

Observations made on the solar eclipse at Humboldt bay, Cal. Rept. 1854, app. 40, p. 127.

Descriptive report of localities on the western coast, from the north entrance of Rosario strait, Washington territory, to the southern boundary of California. Rept. 1855, app. 26,* pp. 176–185.

Occultations of $\alpha$ Scorpii and of the planet Mars observed at Point Hudson, Port Townshend, Washington territory, in April and May, 1856. Rept. 1856, app. 26,* pp. 203–208.

Directory for the Pacific coast of the United States. Rept. 1858, app. 44,* pp. 297–458.

Same, revised. Rept. 1862, app. 39,* pp. 268–430.

New meridian instrument for time, latitude, and azimuth. Rept. 1867, app. 8,* pp. 138, 139.

Coast features and resources of Alaska territory. Rept. 1867, app. 18,* pp. 187–329.

Condensed account of M. Hellert's explorations on the Isthmus of Panama, including his special explorations on the Isthmus of Darien, with suggestions for conducting a future survey. Rept. 1868, app. 15,* pp. 260–277.

Report of observations of the eclipse of the sun on August 7, 1869, made by a party of the Coast survey at Chilkaht river, Alaska. Rept. 1869, app. 8, pp. 177–181.

Changes of elevation and azimuth caused by the action of the sun at station, Dominguez, Cal. Rept. 1870, app. 17,* pp. 178, 179.

Azimuth and apparent altitude of Polaris. Rept. 1870, app. 22,* pp. 225–227.

(And Schott, C. A.) Comparison of the methods of determining heights by means of leveling, vertical angles, and barometric measures. Rept. 1871, app. 11,* pp. 154–170.

Astronomical observations on the Sierra Nevada. Rept. 1872, app. 9,* pp. 173–176.

Field catalogue of 983 transit stars. Mean places for 1870.0. Sep. pub. (1874.)*

The star-factors A, B, C for reducing transit-observations. Sep. pub. (1874.)*

Improved clamp for telescope of the theodolite. Rept. 1874, app. 15,* p. 153.

Transit of Venus (1874). Rept. 1875, app. 13,* pp. 222–230.

Observations on certain harbor and river improvements collected on a voyage from Hongkong, via Suez, to New York. Rept. 1875, app. 18,* pp. 293–314.

(And Schott, C. A.) Comparison of the methods of determining heights by means of leveling, vertical angles, and barometric measures, from observations at Bodega Head and Ross mountain, Cal. Rept. 1876, app. 16, pp. 338–354.

Improved open vertical clamp for telescopes of theodolites and meridian instruments. Rept. 1877, app. 13, pp. 182, 183.

Description of the Davidson meridian instrument. Rept. 1879, app. 7, pp. 103–109.

Measurement of the Yolo base, Cal. Rept. 1882, app. 8, pp. 139–149.

The total solar eclipse of January 11, 1880, observed at Mount Santa Lucia. Rept. 1882, app. 20, pp. 463–468.

(And Gilbert, J. J.) Transit of Mercury of November 7, 1881, as observed at Yolo base, Cal. Rept. 1883, app. 15,* pp. 369–370.

Field catalogue of 1278 time and circumpolar stars; mean places for 1885.0 Rept. 1883, app. 18, pp. 383–471.

The run of the micrometer. Rept. 1884, app. 8, pp. 377–385.

Magnetic variations off the coast of California and Mexico observed by Spanish navigators in the last quarter of the eighteenth century. Rept. 1885, app. 7, pp. 275–284.

The solar (annular) eclipse of March 5, 1886. Rept. 1886, app. 6,* p. 153.

An examination of the early voyages of discovery and exploration on the Northwest coast of America from 1539 to 1603. Rept. 1886, app. 7, pp. 155–253.

Resources of and developments in Alaska. Bull. 4. (1888.)

Measurement of the Los Angeles base line, Los Angeles and Orange counties, Cal. Rept. 1889, app. 10, pp. 217–231.

Ninth conference of the International geodetic association held at Paris, October, 1889. Rept. 1889, app. 18, pp. 493–503.

Address at International geodetic association, ninth conference, Paris, 1889. Rept. 1890, app. 17, pp. 721–733.

Measure of the irregularity in one turn of the micrometer screw and the relative value of each turn. Rept. 1892, pt. 2, app. 9,* pp. 505–513.

**Davidson quadrilaterals.**

Schott, C. A. Trigonometrical determination of the heights of the stations forming the Davidson quadrilaterals. Rept. 1884, app. 10, pp. 391–405.

——— Results deduced from the geodetic connection of the Yolo base line with the primary triangulation of California; also a reduction and adjustment of the Davidson quadrilaterals, forming part of that triangulation. Rept. 1885, app. 9, pp. 441–467.

**Davis, Charles Henry.**

Tables showing temperatures at depths below 700 fathoms, taken by Lieuts. Com. C. H. Davis in 1845, George M. Bache in 1846, and S. P. Lee in 1847. Rept. 1847, app. 11,* p. 75.

**Dean, George Washington.**

Establishment of meridian lines at Petersburg, Va., and Raleigh and Wilmington, N. C. Rept. 1854, app. 44,* p. 146.

---

*Exhausted.

Description of Würdemann zenith telescope of 1855, used at Dixmont, Me. Rept. 1855, app. 44,* pp. 276–278.
Telegraphic method of determining differences of longitude. Rept. 1856, app. 21,* pp. 167–181.
Effect of the wind on the heights of the water in Cat island harbor, Miss. Rept. 1856, app. 45,* pp. 276–278.
(And Schott, C. A.) Results from observations for magnetic declination, dip, and intensity in Maine and Connecticut, including also a station in the District of Columbia. Rept. 1863, app. 22,* p. 204.
Report on experiments made to determine the variation of induction time in relay magnets. Rept. 1863, app. 23,* p. 205.
Eduction time of relay magnets or telegraphic repeaters. Rept. 1864, app. 20,* pp. 211–220.
Report of observations of the eclipse of the sun on August 7, 1869, made by a party of the Coast survey at Shelbyville, Ky. Rept. 1869, app. 8, pp. 137–141.
Total solar eclipse, December 22, 1870. Rept. 1871, app. 13,* pp. 176–179.

**Declination.**
Gould, B. A. Report, and tables, on the declinations [and proper motions in declination] of standard time stars. Rept. 1865, app. 15,* pp. 152–154.
Mitchel, O. M. A new method of recording differences of north polar distances or declination, by electro-magnetism. Rept. 1851, app. 9,* pp. 137–145.
*See also* Astronomy.

**Deep sea.** *See* Atlantic ocean—Bering sea—Currents—Oceanography—Pacific ocean—Sea water—Sounding.

**Deflection of the zenith.** *See* Plumb line deflection.

**Degree measures.** *See* Arc measures.

**Delaware.**
BOUNDARY. Hodgkins, W. C. I. An historical account of the boundary line between the states of Pennsylvania and Delaware. II. Detailed account of work on the Pennsylvania and Delaware boundary. Rept. 1893, pt. 2, app. 8, pp. 177–222.
TERRESTRIAL MAGNETISM. Schott, C. A. Magnetic observations made at stations in Delaware, Maryland, and Virginia. Rept. 1856, app. 29,* pp. 226, 227.
——— Results of observations for magnetic declination, dip, and intensity at stations in Delaware, Maryland, and Virginia. Rept. 1856, app. 30,* p. 227.

**Delaware river and bay.**
CURRENTS. Mitchell, Henry. New rule for currents in Delaware bay and river. Rept. 1881, app. 18, pp. 464–469.

LEVELING. Cutts, R. D. Leveling operations between Keyport on Raritan bay and Gloucester, on the Delaware river, to determine the heights above mean tide of the primary stations Beacon hill, Disboro, Stony hill, Mount Holly, and Pine hill. Rept. 1870, app. 7,* pp. 75, 76.
——— Same. Rept. 1871, app. 12,* pp. 171–175.
PHYSICAL HYDROGRAPHY. Marindin, H. L. Comparison of the surveys of Delaware river in front of Philadelphia, 1843 and 1878. Rept. 1880, app. 9, pp. 110–125.
——— Comparison of the survey of Delaware river of 1819, between Petty's and Tinicum islands, with more recent surveys. Rept. 1882, app. 15, pp. 427–432.
——— Physical hydrography of Delaware river and bay. Rept. 1884, app. 12, pp. 431–434.
——— Comparison of transverse sections in the Delaware river between old Navy yard and east end of Petty's island, for the years 1819, 1843, and 1878. Rept. 1885, app. 12, pp. 487, 488.
Mitchell, Henry. Physical survey of the Delaware river at Philadelphia. Rept. 1878, app. 9, pp. 121–173.
——— Addendum to a report on the physical survey of the Delaware river. Rept. 1879, app. 13, pp. 199, 200.
——— Estuary of the Delaware. Rept. 1883, app. 8, pp. 239–245.
——— Same, addendum. Rept. 1887, app. 13, pp. 263–273.
——— A report on the delta of the Delaware. Rept. 1886, app. 10, pp. 267–279.
TIDES. Tide indicator in Delaware river, Delaware. Notice to mariners 202.
*See also* New Jersey.

**Densimeter.** *See* Hydrometer—Oyster beds

**Densities.** *See* Sea water densities.

**Density of the earth.** *See* Gravity.

**Denver, Colo.—Levels—Rock creek, Wyo.**
Winston, Isaac. Resulting elevations from spirit leveling between Denver, Col., and Rock creek, Wyo. Rept. 1899, app. 5, p. 283–298.

**Dependent directions.** *See* Horizontal measures.

---

* Exhausted.

**Deposit.** *See* Shoals—Tide lands.

**Depth recorder.**
Trowbridge, W. P. Instrument devised by him to register depths in sounding and distance as a log at sea. Rept. 1861, app. 11,* pp. 135–139.
*See also* Sounding apparatus.

**Depths.**
Table showing the least water in the channels of certain rivers, harbors, and anchorages on the coasts of the United States. Rept. 1859, app. 15,* pp. 168–171.
Same, revised and enlarged. Rept. 1862, app. 5,* pp. 86–92.
Same, revised and enlarged. Rept. 1874, app. 7, pp. 66–71.
Bradford, Gershom. Table of depths for channels and harbors, coasts of the United States. Bull. 36. (1897.)
Hilgard, J. E. Description of a model of the depths of the sea in the Bay of North America and Gulf of Mexico. Rept. 1884, app. 17, pp. 619–621.
Lull, Edward P. A table of depths for the harbors of the coasts of the United States. Rept. 1883, app. 7, pp. 137–237.
Whiting, W. D. Least water in channel entrances of rivers, harbors, ports, and anchorages on the coasts of the United States. Rept. 1856, app. 18,* pp. 133–137.
——— Least water in channel entrances to certain harbors, rivers, and anchorages on the coasts of the United States. Rept. 1857, app. 21,* pp. 178–184.
*See also* Channels—Hydrographic surveys—Ocean depths—Oceanography—Physical hydrography—Sounding—Tides.

**Descriptive reports for original field maps.**
Thorn, F. M. Instructions and memoranda for descriptive reports to accompany original sheets. Rept. 1887, app. 11,* pp. 211–215.

**Deviation of the vertical.** *See* Plumb line deflection.

**Differential measures.** *See* Magnetic variations.

**Dip instrument.**
Schott, C. A. Directions for magnetic observations with portable instruments. Rept. 1881, app. 8, pp. 126–158.

**Dip, Magnetic.** *See* Magnetic inclination.

**Dipping needle.** *See* Magnetic needle.

**Discoveries.** *See* Coast pilot—History.

**Distances.** *See* Mile.

**Distribution, Magnetic.** *See* Magnetic distribution.

**District of Columbia.**
LEVELING. Schott, C. A. Result of spirit leveling between tide water at Annapolis, Md., and the Capitol bench mark at Washington, D. C. Rept. 1889, app. 15, pp. 461–466.
——— Resulting heights from spirit leveling between Richmond, Va., and Washington, D. C., 1883 and 1884 with releveling between Richmond and Fredericksburg in 1886 and verification leveling between the two cities in 1895. Rept. 1896, pt. 2, app. 3, pp. 247–260.
TERRESTRIAL MAGNETISM. Schott, C. A. Results for magnetic declination, dip and horizontal intensity in Pennsylvania, in the District of Columbia, and in New York. Rept. 1862, app. 18,* p. 212.
——— Results from observations for magnetic declination, dip and intensity in Maine and Connecticut, including also a station in the District of Columbia. Rept. 1863, app. 22,* p. 204.
*See also* Potomac river—Washington.

**Disturbances, Magnetic.** *See* Magnetic distribution—Magnetic disturbances—Magnetic variations.

**Diurnal variation.** *See* Magnetic variations.

**Dividers.**
Pourtales, L. F. Dividers invented by J. R. Gilliss for graphical decomposition of tidal curves. Rept. 1860, app. 40,* pp. 398, 399.

**Dividing engine.** *See* Graduating apparatus.

**Dobbs Ferry, N. Y.—Levels—Sandy Hook, N. J.**
Schott, C. A. Report of the results of spirit leveling of precision about New York bay and vicinity in 1886 and 1887. Rept. 1887, app. 14, pp. 275–300.

**Docks.**
Davidson, George. Observations on certain harbor and river improvements collected on a voyage from Hongkong, via Suez, to New York. Rept. 1875, app. 18,* pp. 293–314.

---

* Exhausted.

**Dominguez, Cal.**

Davidson, George. Changes of elevation and azimuth caused by the action of the sun at station, Dominguez, Cal. Rept. 1870, app. 17,* pp. 178–179.

**Doolittle, Myrick Hascall.**

(And Schott, C. A.) Method of closing a circuit of triangulation under certain conditions. Rept. 1875, app. 17,† pp. 279–292.

[Solution of normal equation and adjustment of triangulation.] Rept. 1878, app. 8. Paper no. 3, pp. 115–120.

[Extension of Pimsant's formula for computation of geodetic positions.] Rept. 1894, app. 9, p. 284.

**Drake, James C.**

On the sounds and estuaries of Georgia with reference to oyster culture. Bull. 19. (1891.)

**Drawing.**

Hergesheimer, Edwin. Preparation of standard topographical drawings. Rept. 1879, app. 11,* p. 191.

——— Report on the preparation of standard topographical drawings. Rept. 1883, app. 14,* pp. 367, 368.

Whiting, H. L. Topographical contour, hydrographic details and reduction, on photography and on the scale of shades suitable for complete maps. Rept. 1860, app. 20,* pp. 216–229.

*See also* Engraving—Hydrography—Lettering—Paper—Photography—Plane table—Projection—Topography.

**Drawing instruments.** *See* Dividers.

**Dredging.**

Pourtales, L. F. Microscopical examination of specimens of bottom from deep-sea soundings. Rept. 1858, app. 39,* pp. 248–250.

CARIBBEAN SEA. Agassiz, Alexander. Dredging operations in the Caribbean sea. Rept. 1879, app. 6,* pp. 95–102.

FLORIDA. Pourtales, L. F. Report upon dredgings near the Florida reef. Rept. 1868, app. 12,* pp. 168–170.

GULF STREAM. Agassiz, L. Report upon deep-sea dredgings in the Gulf Stream during the third cruise of the United States steamer Bibb. Rept. 1869, app. 10,* pp. 208–219.

Bailey, J. W. On the characteristics from bottom sounding in the Florida section of the Gulf Stream. Rept. 1855, app. 55,* p. 360.

Pourtales, L. F. Examination of specimens of bottom obtained in Gulf Stream. Rept. 1853, app. 30,* pp. 82, 83.

——— Fauna of the Gulf stream. Rept. 1867, app. 16,* pp. 180–182.

——— Characteristics of the Atlantic sea bottom off the coast of the United States. Rept. 1869, app. 11,* pp. 220–225.

*See also* Ocean depths—Sea bottom—Sea water—Sounding.

**Dredging apparatus.**

Craven, T. A. Specimen box for bringing up the bottom in deep-sea soundings. Rept. 1854, app. 54,* pp. 191, 192.

Mitchell, H. Implements devised for collecting specimens of bottom in alluvial harbors. Rept. 1860, app. 39,* pp. 398.

Sands, B. F. Instrument for procuring specimens of bottom in sounding. Rept. 1855, app. 56,* p. 361.

Sigsbee, Chas. D. Deep sea sounding and dredging. A description and discussion of the methods and appliances used on board the Coast and geodetic survey steamer Blake. Sep. pub. (1880.)*

Trowbridge, W. P. Apparatus devised by [him] and method of applying it in determining ocean depths and obtaining specimens of bottom. Rept. 1859, app. 34,* pp. 359–364.

*See also* Sounding apparatus.

**Duffield, William Ward.**

Logarithms, their nature, computation and uses, with logarithmic tables of numbers and circular functions to ten places of decimals. Rept. 1896, pt. 2, app. 12,* pp. 395–722.

*See also* as Superintendent in Reports and other publications, 1894–97.

**Duplex base bar apparatus.**

Eimbeck, W. The duplex base apparatus and directions for its use in the field. Rept. 1897, app. 11, pp. 737–752.

**Earth, The.** *See also* Constitution of the earth—Ellipticity of the earth—Figure of the earth—Geo-physics—Gravity—Terrestial magnetism.

**Earthquake waves.**

Bache, A. D. Notice of earthquake waves on the western coast of the United States, December 23 and 25, 1854. Rept. 1855, app. 51,* pp. 342–346.

——— Same. Rept. 1862, app. 24,* pp. 238–241.

Hilgard, J. E. The earthquake wave of August 18, 1868. Rept. 1869, app. 13, pp. 233, 234.

**East river, N. Y.** *See* Hell Gate—Throg's Neck—New York harbor.

---

* Exhausted.

**Eastern oblique arc.**

Schott, C. A. Primary triangulation between Kent island, Md. and Atlanta, Ga. base lines. Rept. 1878, app. 8, pp. 92–120.

——— Comparison of local deflection of the plumb line in latitude, longitude and azimuth at stations of the oblique arc along our Atlantic coast as developed on Bessel's and Clarke's spheroids. Rept. 1879, app. 8, pp. 110–123.

——— The eastern oblique arc of the United States and osculating spheroid. Sp. pub. 7. (1902.)

*See also* Alabama—Connecticut—Georgia—Maine—Nantucket arc—Maryland—Massachusetts—Mississippi—New Jersey—New York—North Carolina—South Carolina.

**Eastport, Me.**

Results of magnetic observations made at Eastport, Me., between 1860 and 1864. Rept. 1865, app. 18,* pp. 166–174.

Predictions for Eastport, Me., as a specimen of tide tables for the Atlantic and Pacific coasts. Rept. 1866, app. 7,* pp. 47–49.

Pourtales, L. F. Magnetic station at Eastport, Me. Rept. 1860, app. 27,* pp. 350, 351.

**Ebensburg, Pa.**

Peirce, C. S. Determinations of gravity at Allegheny, Ebensburg, and York, Pa. Rept. 1883, app. 19, pp. 473–487.

**Eclipses.**

Peirce, Benjamin. Determination of longitudes by occultations of the Pleiades and solar eclipses. Rept. 1857, app. 29,* pp. 311–314.

Walker, S. C. Abstract of reports on longitudes. Rept. 1851, app. 26,* pp. 480, 481.

**1851,** July 28. Peirce, Benjamin. Report upon the determination of the longitudes of America and Europe from the solar eclipse of July 28, 1851. Rept. 1861, app. 16, pp. 182–195.

**1854,** May 26. Blunt, E. Solar eclipse, May 26, 1854. Rept. 1854, app. 40,* pp. 122–127.

**1860,** July 18. Alexander, Stephen. Expedition to Labrador to observe the total eclipse of the 18th of July, 1860. Report on the determination of the magnetic elements by Edward Goodfellow, assistant, with notes by C. A. Schott, assistant. Rept. 1860, app. 21,* pp. 229–275.

Bache, A. D. Observations of solar eclipse of July, 1860, at Gunstock mountain, N. H. Rept. 1861, app. 19, pp. 232–239.

Gilliss, J. M. Solar eclipse of July, 1860, observed near Fort Steilacoom, W. T. Rept. 1860, app. 22,* pp. 275–292.

Gould, B. A. Observations of solar eclipse of July, 1860, at Cambridge, Mass. Rept. 1861, app. 21, pp. 241, 242.

Murray, A. Labrador eclipse expedition and incidental results bearing on the hydrography of the coast of Labrador. Rept. 1860, app. 41,* pp. 399–402.

Schott, C. A. Observations of the solar eclipse of July, 1860, at the Coast survey office. Rept. 1861, app. 20, pp. 239–241.

**1869,** August 7. Reports of observations of the eclipse of the sun made by parties of the Coast survey at various points. Rept. 1869, app. 8, pp. 116–198.

**1870,** December 22. Dean, G. W. Total solar eclipse, December 22, 1870. Rept. 1871, app. 13,* pp. 176–179.

Peirce, Benjamin. The solar eclipse of December 22, 1870. Rept. 1870, app. 16, pp. 229–232.

Peters, C. H. F. Eclipse of the sun, December 22, 1870. Rept. 1871, app. 14,* pp. 180–184.

**1880,** January 11. Davidson, George. The total solar eclipse of Jan. 11, 1880, observed at Mount Santa Lucia, Cal. Rept. 1882, app. 20, pp. 463–468.

**1883,** May 6. Preston, E. D. Determinations of gravity and other observations made in connection with the Solar eclipse expedition, May, 1883, to Caroline island. Rept. 1883, app. 17,* pp. 379–381.

**1886,** March 5. Davidson, George. The solar eclipse of March 5, 1886. Rept. 1886, app. 6,* p. 153.

*See also* Moon—Occultation—Pleiades—Sun.

**Edgartown harbor, Mass.**

Marindin, H. L. Tides and currents in the harbor of Edgartown and in Katama bay, Martha's Vineyard. Rept. 1892, pt. 2, app. 5, pp. 225–241.

Whiting, Henry L. Report of changes in the shore line and beaches of Martha's Vineyard, as derived from comparisons of recent with former surveys. Rept. 1886, app. 9, pp. 263–266.

——— Shore-line changes at Edgartown harbor, Mass. Rept. 1872, app. 17,* pp. 262–265.

**Edisto island base, S. C.**

Schott, C. A. Report on the resulting length and probable uncertainty of five principal base lines, measured with the Bache-Würdemann compensation base apparatus between 1847 and 1855. Rept. 1889, app. 17, pp. 479–491.

**Eduction time.**

Dean, G. W. Eduction time of relay magnets. Rept. 1864, app. 20,* pp. 211–220.

**Eimbeck, William.**

Improvement on the Hipp chronograph. Rept. 1872, app. 18,* pp. 266, 267.

Transit of Venus of December 6, 1882, at Lehman's ranch, Nevada. Rept. 1883, app. 16, pp. 376–378.

---

* Exhausted.

The duplex base apparatus, and directions for its use in the field. Rept. 1897, app. 11, pp. 737–752.

Report on the measurement of the Salt Lake base line, in Utah. Rept. 1897, app. 12, pp. 753–774.

**El Reno base, Okla.**

Baldwin, A. L. On the measurement of nine base lines along the ninety-eighth meridian. Rept. 1901, app. 3, pp. 229–302.

**Electricity.**

Units of electrical measure. Bull. 30. (1894.)

Legal units of electrical measure in the United States. Bull. 31. (1894.)

Units of electrical measure. Rept. 1893, pt. 2, app. 7, pp. 173–176.

Mathiot, G. Description of (Mathiot's) self-sustaining voltaic battery. Rept. 1854, app. 56,* pp. 193–201.

——— On a method of measuring galvanic currents of great quantity. Rept. 1855, app. 63,* pp. 370–373.

——— Time required to produce the maximum intensity of a voltaic current. Rept. 1855, app. 61,* pp. 366–368.

*See also* Atmospheric electricity—Electrotyping—Transmission time.

**Electro-magnetism.**

Dean, G. W. Report on preliminary experiments made to determine the variations of "induction time" in relay magnets. Rept. 1863, app. 23,* p. 205.

——— "Eduction time" of relay magnets or telegraphic repeaters. Rept. 1864, app. 20,* pp. 211–220.

Mitchel, O. M. A new method of recording differences of north polar distances, or declination, by electro-magnetism. Rept. 1851, app. 9,* pp. 137–145.

Schott, C. A. Gradual loss of magnetism of the several magnets in use in the survey of the coast. Rept. 1857, app. 32,* pp. 334–342.

**Electrotypes.**

Mathiot, G. Printing maps from their electrotyped plates. Rept. 1856, app. 62,* pp. 316, 317.

**Electrotyping.**

Mathiot, G. Electrotyping operations of the Coast survey. Rept. 1851, app. 55,* pp. 541–553.

——— Same. Rept. 1866, app. 20, pp. 130–138.

——— Reports on electrotype operations and chemiglyphic experiments. Rept. 1854, app. 31,* pp. 54–57.

——— Time required to produce the maximum intensity of a voltaic current. Rept. 1855, app. 61,* pp. 366–368.

——— Improved methods for taking entire casts from detached plates by electrotype process. Rept. 1855, app. 62,* p. 369.

Zumbrock, A. Electrotyping and photographing. Rept. 1875, app. 6,* pp. 87, 88.

*See also* Electricity—Engraving.

**Elevations.**

List of heights, above the half-tide level of the ocean, of trigonometrical stations determined by the United States Coast survey. Rept. 1870, app. 9,* pp. 90, 91.

Table of coefficients for reducing inclined sights on vertical rod to horizontal distance. Sep. pub. (1900.)

Table of factors for computing differences in elevation (in feet). Table of corrections for curvature and refraction (in feet). Sep. pub. (1900.)

Table showing the height in meters, corresponding to given angles of elevation and distances in meters. Sep. pub. (1900.)

Mitchell, Henry. Method of determining elevations along the course of a tidal river, without the aid of a leveling instrument. Rept. 1870, app. 11,* pp. 98, 99.

——— Alleged changes in the relative elevations of land and sea. Rept. 1877, app. 8,* pp. 98–103.

Schott, C. A. Height in feet corresponding to a given angle of elevation and a given distance in meters for use in the construction of contour lines by plane table. Rept. 1860, app. 38,* p. 397.

——— Atmospheric refraction and adjustment of hypsometric measures. Rept. 1876, app. 18, pp. 368–387.

Cram, T. J. Reports on measurement of heights. Rept. 1854, app. 34,* pp. 95–103.

ALABAMA. Schott, Chas. A. Heights from spirit levelings of precision between Mobile, Ala., and Carrollton (New Orleans), La., 1885–86. Rept. 1887, app. 9, pp. 185–205.

——— Heights from spirit leveling of precision between Mobile, Ala., and Okolona, Miss. Rept. 1888, app. 10, pp. 409–426.

ALASKA. Dall, W. H. Geographical and hydrographical explorations on the coast of Alaska. Rept. 1873, app. 11,* pp. 111, 122.

ARKANSAS. Schott, C. A. Heights from spirit leveling of precision between New Orleans, La., and Arkansas City, Ark. Rept. 1888, app. 11, pp. 427–453.

——— Heights from spirit leveling of precision between Arkansas City (on the Mississippi river) and Little Rock, Ark. Rept. 1888, app. 12, pp. 455–464.

---

* Exhausted.

CALIFORNIA. Davidson, George. Changes of elevation and azimuth caused by the sun's action at Dominguez, Cal. Rept. 1870, app. 17,* pp. 178, 179.

——— (And Schott, C. A.). Comparison of the methods of determining heights by means of leveling, vertical angles, and barometric measures, from observations at Bodega Head and Ross mountain, Cal. Rept. 1871, app. 11,* pp. 154–170.

Schott, C. A. Trigonometrical determination of the heights of the stations forming the Davidson quadrilaterals, California, 1876–1882. Rept. 1884, app. 10, p. 391–405.

COLORADO. Schott, C. A. Resulting heights from spirit leveling between Ellis, Kans., and Hugo, Colo. Rept. 1898, app. 2, pp. 195–214.

——— Resulting heights from spirit leveling between Hugo and Colorado Springs, Colo. Rept. 1898, app. 3, pp. 215–228.

Winston, Isaac. Resulting elevations from spirit leveling between Denver, Col., and Rock Creek, Wyo., from observations between May 12 and October 21, 1899. Rept. 1899, app. 5, pp. 283–298.

DISTRICT OF COLUMBIA. Schott, C. A. Resulting heights from spirit leveling between Washington, D. C., and Hagerstown, Md., 1883. Rept. 1896, pt. 2, app. 4, pp. 261–264.

——— Result of spirit leveling between tide water at Annapolis, Md., and the Capitol bench mark at Washington, D. C. Rept. 1889, app. 15, pp. 461–466.

ILLINOIS. Schott, C. A. Results of spirit leveling of precision between Okolona, Miss., and Odin, Ill. Rept. 1892, pt. 2, app. 3, pp. 161–203.

KANSAS. Schott, C. A. Resulting heights from spirit leveling between Jefferson city, Mo., and Holliday, Kans., 1891. Rept. 1896, pt. 2, app. 5, pp. 265–284.

——— Resulting heights from spirit leveling between Holliday and Salina, Kans. Rept. 1897, pt. 2, app. 4, pp. 269–283.

——— Resulting heights from spirit leveling between Salina and Ellis, Kans. Rept. 1898, app. 1, pp. 179–193.

——— Resulting heights from spirit leveling between Ellis, Kans., and Hugo, Colo. Rept. 1898, app. 2, pp. 195–214.

Tilton, B. E. Resulting elevations from spirit leveling between Abilene, Kans., and Norfolk, Neb., 1899. Rept. 1899, app. 6, pp. 299–320.

LOUISIANA. Schott, C. A. Heights from spirit levelings of precision between Mobile, Ala., and Carrollton (New Orleans), La. Rept. 1887, app. 9, pp. 185–205.

——— Heights from spirit leveling of precision between New Orleans, La., and Arkansas city, Ark. Rept. 1888, app. 11, pp, 427–453.

MARYLAND. Schott, C. A. Result of spirit leveling between tide water at Annapolis, Md., and the Capitol bench mark at Washington, D. C. Rept. 1889, app. 15, pp. 461–466.

——— Resulting heights from spirit leveling between Washington, D. C., and Hagerstown, Md., 1883. Rept. 1896, pt. 2, app. 4, pp. 261–264.

MICHIGAN. Ferguson, O. W. Resulting elevations from spirit leveling between Gibraltar, Mich., and Cincinnati, Ohio. Rept. 1899, app. 7, pp. 321–345.

MISSISSIPPI. Schott, C. A. Heights from spirit leveling of precision between Mobile, Ala., and Okolona, Miss. Rept. 1888, app. 10, pp. 409–426.

——— Heights from spirit leveling of precision between Mobile, Ala., and Carrollton (New Orleans), La. Rept. 1887, app. 9, pp. 185–205.

——— Results of spirit leveling of precision between Okolona, Miss., and Odin, Ill. Rept. 1892, pt. 2, app. 3, pp. 161–203.

——— On the results of spirit leveling of precision between Corinth, Miss., and Memphis, Tenn. Rept. 1892, pt. 2, app. 4, pp. 205–224.

MISSOURI. Schott, C. A. Heights from geodetic leveling between St. Louis and Jefferson City, Mo., 1882–1888. Rept. 1893, pt. 2, app. 2, pp. 19–36.

——— Resulting heights from spirit leveling between Jefferson City, Mo., and Holliday, Kans. Rept. 1896, pt. 2, app. 5, pp. 265–284.

NEBRASKA. Tilton, B. E. Resulting elevations from spirit leveling between Abilene, Kans., and Norfolk, Neb., 1899. Rept. 1899, app. 6, pp. 299–320.

NEW JERSEY. Cutts, R. D. Leveling operations between Keyport, on Raritan bay, and Gloucester, on the Delaware river, to determine the heights above mean tide of the primary stations Beacon hill, Disboro, Stony hill, Mount Holly, and Pine hill. Rept. 1870, app. 7,* pp. 75, 76.

——— Same, revised. Rept. 1871, app. 12,* pp. 171–175.

——— Barometrical observations made in connection with the line of spirit leveling from Raritan bay to the Delaware river to determine the heights above mean tide of the primary stations. Rept. 1870, app. 8,* pp. 77–89.

NEW YORK BAY. Schott, C. A. Report of the results of spirit leveling of precision about New York bay and vicinity in 1886 and 1887. Rept. 1887, app. 14, pp. 275–300.

OHIO. Ferguson, O. W. Resulting elevations from spirit leveling between Gibraltar, Mich., and Cincinnati, Ohio. Rept. 1899, app. 7, pp. 321–345.

UNITED STATES. Schott, C. A. Results of the transcontinental line of geodetic spirit leveling near the parallel of 39°. Part first, Sandy Hook, N. J., to St. Louis, Mo. Rept. 1882, app. 11,* pp. 517–556.

Hayford, J. F. Precise leveling in the United States. Rept. 1899, app. 8, pp. 347–886.

VIRGINIA. Schott, C. A. Resulting heights from spirit leveling between Old Point Comfort and Richmond, Va., 1884, 1891, and 1892. Rept. 1896, pt. 2, app. 2, pp. 237–246.

---

* Exhausted.

VIRGINIA. Resulting heights from spirit leveling between Richmond, Va., and Washington, D. C., 1883 and 1884, with releveling between Richmond and Fredericksburg in 1886 and verification leveling between the two cities in 1895. Rept. 1896, pt. 2, app. 3, pp. 247-260.

WYOMING. Winston, Isaac. Resulting elevations from spirit leveling between Denver, Col., and Rock Creek, Wyo., 1899. Rept. 1899, app. 5, pp. 283-298.

*See also* Barometric hypsometry—Bench marks—Leveling—Sea level—Shore line changes—Vertical measures—Water levels.

**Eleven year period.** *See* Magnetic variation.

**Ellipticity of the earth.**

Peirce, C. S. On the deduction of the ellipticity of the earth from pendulum experiments. Rept. 1881, app. 15, pp. 442-456.

*See also* Figure of the earth.

**Ellis, Kans.—Levels—Hugo, Colo.**

Schott, C. A. Resulting heights from spirit leveling between Ellis, Kans., and Hugo, Col., 1897. Rept. 1898, app. 2, pp. 195-214.

**Ellis, Kans.—Levels—Salina, Kans.**

Schott, C. A. Resulting heights from spirit leveling between Salina and Ellis, Kan. Rept. 1898, app. 1, pp. 179-193.

**Emery, Charles E.**

Economy in coal as exemplified by the action of compound engines in the steamer Hassler. Rept. 1874, app 13,* pp. 148-151.

On marine governors. Rept. 1876, app. 13,* pp. 192-196.

**Eminent domain.**

Fairfield, G. A. State laws authorizing entrance upon lands within state limits for the purposes of the U. S. Coast and geodetic survey. Rept. 1893, pt. 2, app. 1, pp. 1-18.

**Employees.** *See* List of Official reports of expenditures and of persons employed (under administrative publications) in Part I.

**Encroachment of the sea.** *See* Shore line changes.

**Engineer corps, U. S. A.** *See* Lake survey.

**Engineering.** *See* Geodesy—Hydraulic engineering—Marine engineering—Physical hydrography—Surveying.

**Engines.**

Emery, Chas. E. Economy in coal as exemplified by the action of compound engines in the steamer Hassler. Rept. 1874, app. 13,* pp. 148-151.

——— On marine governors. Rept. 1876, app. 13,* pp. 192-196.

*See also* Boilers.

**England.** *See* Greenwich—Liverpool.

**Engraving.**

Hunt, E. B. Report on engraving. Rept. 1854, app. 57,* pp. 201-212.

*See also* Drawing—Electrotyping—Etching—Lithography—Pantograph—Photography—Printing.

**Epping base, Me.**

Results of the primary triangulation of the coast of New England, from the northeastern boundary to the vicinity of New York. Rept. 1865, app. 21,* pp. 187-203.

Bache, A. D. Notes on the measurement of a base on Epping plains, Me. Rept. 1857, app. 26,* pp. 302-305.

Schott, C. A. Report on the method of reduction and results of connexion of the Epping base line with the primary triangulation in the eastern states. Rept. 1864, app. 14,* pp. 120-144.

**Equations, Solution of.**

Schott, C. A. Solution of normal equations by indirect elimination. Rept. 1855, app. 40,* pp. 255-264.

Doolittle, M. H. [Solution of normal equations and adjustment of triangulation.] Rept. 1878, app. 8, pp. 115-120.

**Equilibrium theory of tides.**

Harris, Rollin A. Manual of tides. Part II. Tidal observation, equilibrium theory, and harmonic analysis. Rept. 1897, pt. 2, app. 9, pp. 471-618.

Peirce, Benjamin. Cotidal lines of an inclosed sea derived from the equilibrium theory. Rept. 1858, app. 30,* pp. 210-213.

---

* Exhausted.

**Errata.**
Errata in reports from 1851 to 1870. Rept. 1871, app. 18,* pp. 210–219.
Errata in the Heis catalogue of stars. Rept. 1873, app. 15, pp. 175–180.

**Errors.** *See* Adjustment—Least square method.

**Estimates.** *See* List of Reports submitting estimates and of Official reports of expenditures (under Administrative publications) in Part I.

**Estuaries.** *See* Chesapeake Bay—Delaware river—Georgia—Harbors—Long Island sound—North Carolina—Rivers.

**Etching.**
Mathiot, G. Reports on electrotype operations and chemiglyphic experiments. Rept. 1854, app. 31,* pp. 54–57.

**Europe.**
Peirce, Benjamin. Report upon the determination of the longitude of America and Europe from the solar eclipse of July 28, 1851. Rept. 1861, app. 16, pp. 182–195.
Peirce, C. S. Measurements of gravity at initial stations in United States and Europe. Rept. 1876, app. 15,* pp. 202–337.
Putnam, G. R. Determination of relative value of gravity in Europe and the United States in 1900. Rept. 1901, app. 5, pp. 345–355.
*See also* America—Arctic ocean—Atlantic ocean—France—Great Britain—Italy—Stuttgart.

**Evans, A. W.**
Topographical reconnaissance of a part of Sapelo island, Georgia, for the selection of a site for a primary base line. Rept. 1857, app. 39,* pp. 374–377.

**Evans, F. J.**
Table for navigators showing the variation of the compass for the year 1858. Rept. 1859, app. 16,* pp. 172–175.

**Exhibits.** *See* Expositions.

**Expansion.**
Hilgard, J. E. Results of experiments for determining the length and rate of expansion of the six-metre standard bar. Rept. 1862, app. 26,* pp. 248–255.
Lane, J. Homer. Coefficient of expansion of the British standard yard bar, bronze no. 11; being a new discussion of the experiments of Sheepshanks and Clarke. Rept. 1877, app. 12, pp. 155–166.
*See also* Standards.

**Expansion of paper.** *See* Paper—Drawing.

**Expeditions.** *See* Aulezavik island eclipse expedition—Bering expedition—Caroline island eclipse expedition—Greely arctic expedition—Greenland expedition—Hellert's expedition—Labrador—United States eclipse expedition.

**Expenditures.** *See* List of Laws and regulations, Official reports of expenditures and persons employed, Reports submitting estimates and Official reports of expenditures (under administrative publications) in Part I.

**Exploration.** *See* Expeditions—Gulf Stream—History—Voyages.

**Expositions.** *See* Centennial exposition, Cincinnati, O.—Cotton centennial exposition, New Orleans, La.—Pan-American exposition, Buffalo, N. Y.—Southern exposition, Louisville, Ky.—World's columbian exposition, Chicago, Ill.

**Factors.** *See* Formulæ and factors.

**Fairfield, George Albert.**
State laws authorizing entrance upon lands within state limits for the purposes of the U. S. Coast and geodetic survey. Rept. 1893, pt. 2, app. 1, pp. 1–18.

**Fairweather, Mt., Alas.** *See* Mt. Fairweather.

**Farallon island, Cal.** *See* South Farallon island.

**Farley, John.**
Description and drawing of a convenient signal for observing on secondary stations. Rept. 1855, app. 58,* pp. 363, 364.

**Fauna.** *See* Dredging—Sea bottom—Zoology.

**Ferguson, Oscar Wood.**
Resulting elevations from spirit leveling between Gibraltar, Mich., and Cincinnati, Ohio. Rept. 1899, app. 7, pp. 321–345.

---

* Exhausted.

**Fernandina, Fla.—Longitude—Savannah, Ga.**
Bache, A. D., and Schott, C. A. Determination of the longitude of Fernandina, Amelia island, Fla., by means of chronometric exchanges with Savannah, Ga. Rept. 1857, app. 30,* pp. 314–324.

**Ferrel, William.**
Discussion of the tides in Boston harbor. Rept. 1868, app. 5,* pp. 51–102.
On the moon's mass, as deduced from a discussion of the tides of Boston harbor. Rept. 1870, app. 20,* pp. 190–199.
Meteorological effects on tides. Rept. 1871, app. 6,* pp. 93–99.
Maxima and minima of tides on the coast of New England for 1873. Rept. 1872, app. 7,* pp. 73, 74.
Tidal researches. Sep. pub. (1874.)
Discussion of tides in New York harbor. Rept. 1875, app. 12, pp. 194–221.
Meteorological researches for the use of the Coast pilot. Rept. 1875, app. 20,* pp. 369–412.
Same. Part II. Rept. 1878, app. 10,* pp. 175–267.
Tides in Penobscot bay. Rept. 1878, app. 11, pp. 268–304.
Meteorological researches, Part III. Rept. 1881, app. 10, pp. 225–268.
Tides of the Pacific coast of the United States. Rept. 1882, app. 17, pp. 437–450.
Harmonic analysis of the tides at Sandy Hook. Rept. 1883, app. 9, pp. 247–251.
Maxima and minima tide predicting machine. Rept. 1883, app. 10, pp. 253–272.
On the harmonic analysis of tides at Governor's island, New York harbor. Rept. 1885, app. 13, pp. 489–493.

**Figure adjustment.** *See* Adjustment.

**Figure of the earth.**
Peirce, C. S. On the deduction of the ellipticity of the earth from pendulum experiments. Rept. 1881, app. 15, pp. 442–456.
Schott, C. A. The Chesapeake-Pamplico arc of the meridian and its combination with the Nantucket and the Peruvian arcs for a determination of the figure of the earth from American measures. Rept. 1877, app. 6, pp. 84–95.
——— The eastern oblique arc of the United States and osculating spheroid. Sp. pub. 7. (1902.)
*See also* Arc measures—Ellipticity of the earth.

**Fiord.** *See* Hudson river fiord.

**Fire island base, N. Y.**
Results of the primary triangulation of the coast of New England from the northeastern boundary to the vicinity of New York. Rept. 1865, app. 21,* pp. 187–203.

**Fischer, Ernest George.**
(And Schott, C. A., Tittmann, O. H., Preston, E. D., Smith, E., and Putnam, G. R.) Observations of the transit of Mercury on November 10, 1894, made at the Coast and geodetic survey office, Washington, D. C. Rept. 1895, pt. 2, app. 4,* pp. 345, 346.
Description of precise levels nos. 7 and 8, Coast and geodetic survey, 1900. Rept. 1900, app. 6, pp. 521–534.

**Fish bay, Alas.**
Notes on dangers in Neva and Peril straits and anchorages in Fish bay, southeast Alaska. Notice to mariners 46. (1884.)

**Fish commission.**
Libby, William, jr. Relations of cold and warm ocean currents off the New England coast, by the U. S. Fish commission, with the co-operation of the U. S. Coast and geodetic survey. Rept. 1891, pt. 2, app. 7,* pp. 279–281.

**Flemer, John Adolph.**
Phototopography as practiced in Italy under the auspices of the Royal military geographical institute, and as practiced in the Dominion of Canada under the auspices of the Department of the interior. Also a short historical review of other photographic surveys and publications on the subject. Rept. 1893, pt. 2, app. 3, pp. 37–116.
(Translator.) On photography as applied to obtain an instantaneous record of lunar distances for determinations of longitude. By C. Runge. Rept. 1893, pt. 2, app. 4, pp. 117–124.
Phototopographic methods and instruments. Rept. 1897, pt. 2, app. 10, pp. 619–735.

**Floats.** *See* Current float—Currents.

**Florida.**
CURRENTS. Current bottles from Mobile bay to Mosquito inlet and Cape Florida to Jupiter inlet. Rept. 1854, app. 52,* pp. 189, 190.
GEOLOGY. Gibbs, W. Examination of specimens of sand taken from the base-sites at Cape Florida and Cape Sable. Rept. 1856, app. 64,* pp. 318, 319.
RECONNAISSANCE. Agassiz, Louis. Examination of the Florida reefs, keys and coast. Rept. 1851, app. 10,* pp. 145–150.

---

* Exhausted.

RECONNAISSANCE. Gerdes, F. H. Reconnaissance of the Florida keys. Rept. 1850, app. 23,* pp. 106–110.

——— Florida coast reconnaissance. Rept. 1851, app. 31,* pp. 488–494.

Simpson, J. H. Reconnaissance and progress made in triangulation for an air-line between Fernandina and Cedar Keys, Fla. Rept. 1857, app. 41,* pp. 379–382.

*See also* Atlantic coast—Barnes sound—Cape Florida base—Cape Sable base—Fernandina—Florida keys—Florida reef—Gulf coast—Gulf Stream—Key Biscayne base—Key West.

**Florida keys.**

Totten, James. Climate, soil, and general character of Florida keys. Rept. 1853, app. 18,* pp. 50, 51.

RECONNAISSANCE. Gerdes, F. H. Reconnaissance of the Florida keys. Rept. 1850, app. 23,* pp. 106–110.

Agassiz, Louis. Examination of Florida reefs, keys and coast. Rept. 1851, app. 10,* pp. 145–160.

SURVEYS. Survey of the Florida keys and reconnaissance of Barnes sound. Rept. 1855, app. 25,* pp. 171–176.

Report to the Commissioner of the general land office showing the progress made in the survey and marking (in quarter sections) of the Florida keys. Rept. 1856, app. 52,* pp. 286–289.

Report to Commissioner of general land office on progress made in surveying and marking of the Florida keys. Rept. 1857, app. 42,* pp. 382–390.

Superintendent's report to Commissioner of general land office on progress made in surveying and marking of the keys. Rept. 1858, app. 35,* pp. 225–227.

*See also* Florida reef.

**Florida reef.**

Agassiz, Louis. Examination of Florida reefs, keys and coast. Rept. 1851, app. 10,* pp. 145–160.

——— Same, reprint. Rept. 1866, app. 19,* pp. 120–130.

Gerdes, F. H. Reconnaissance of the Florida keys. Rept. 1850, app. 23,* pp. 106–110.

Hunt, E. B. Origin, growth, substructure, and chronology of the Florida reef. Rept. 1862, app. 25,* pp. 241–248.

Pourtales, L. F. Report upon dredgings near the Florida reef. Rept. 1868, app. 12,* pp. 168–170.

Totten, James. On placing screw pile signals along the Florida reef. Rept. 1852, app. 14,* pp. 97, 98.

——— Erection of screw pile beacons on Florida reef with description of signals. Rept. 1855, app. 16,* pp. 157–160.

*See also* Key West.

**Florida straits.**

Bache, A. D. Gulf Stream explorations; third memoir. Distribution of temperature in the water of the Florida channel and straits. Rept. 1859, app. 25,* pp. 306–310.

Haskell, E. E. On observations of currents with the direction current-meter in the Straits of Florida and in the Gulf of Mexico, 1891. Rept. 1891, pt. 2, app. 10, pp. 343–364.

Mitchell, H. [Soundings across the Florida straits.] Rates of outrun of line. Rept. 1866, app. 5,* pp. 35–44 and p. 139.

——— Report on soundings made to develop the character of the Strait of Florida between Key West and Havana. Rept. 1867, app. 15,* pp. 176–179.

*See also* Gulf Stream.

**Fluid.** *See* Motion—Viscous fluid.

**Formulæ and factors.**

Formulæ tables and example for computing geodetic latitudes, longitudes, and azimuths. Rept. 1860, app. 36,* pp. 361–391.

Same. Ed. 2. Title changed to Formulæ and factors for the computation of geodetic latitudes, longitudes, and azimuths. Much enlarged. Rept. 1875, app. 19,* pp. 315–368.

Same. Ed. 3. Rept. 1884, app. 7,* pp. 323–375.

Same. Ed. 4. Title changed to Formulæ and factors for the computation of geodetic positions. Rept. 1894, pt. 2, app. 9, pp. 277–348.

Table of factors for computing differences in elevation. Table of corrections for curvature and refraction. Sep. pub. (1900.)

**Fort Steilacoom.**

Gilliss, J. M. Solar eclipse of July, 1860, observed near Fort Steilacoom, W. T. Rept. 1860, app. 22,* pp. 275–292.

Schott, C. A. Observations for daily variation of the magnetic declination, made at Fort Steilacoom, Washington territory, in 1866, and at Camp Date creek, Arizona, in 1867. Rept. 1870, app. 15,* pp. 111–114.

**Fox, Gustavus Vasa.**

An attempt to solve the problem of the first landing place of Columbus in the New world. Rept. 1880, app. 18, pp. 346–411.

---

* Exhausted.

**Fox islands passes, Alas.**
Jarvis, D. H. Coast pilot notes on the Fox islands passes, Unalaska bay, Bering sea, and Arctic ocean as far as Point Barrow. Bull. 40. (1900.)

**France.**
Hilgard, J. E. The relations of the lawful standards of measures of the United States to those of Great Britain and France. Rept. 1876, app. 22, pp. 402-406.
*See also* Paris.

**Fredericksburg, Va.—Levels—Richmond, Va.**
Schott, C. A. Resulting heights from spirit leveling between Richmond, Va., and Washington, D. C., 1883 and 1884, with releveling between Richmond and Fredericksburg in 1886 and verification leveling between the two cities in 1895. Rept. 1896, pt. 2, app. 3, pp. 247-260.

**Functions.**
Schott, C. A. Development of Bessel's functions for periods frequently occurring in magnetic and meteorological investigations, with examples. Rept. 1862, app. 22,* pp. 232-235.

**Fundamenta.** *See* Astronomiæ fundamenta—Bradley-Bessel fundamenta.

**Gaithersburg, Md.**
Smith, Edwin, and Schlesinger, F. The International latitude service at Gaithersburg, Md., and Ukiah, Cal., under the auspices of the International geodetic association. Rept. 1900, app. 5, pp. 495-520.

**Galvanic current.** *See* Electricity.

**General land office.** *See* Land surveys.

**Geodesy.**
Geodesy or the measurement of the earth. (Leaflet printed for distribution at the Pan-American exposition.) Sep. pub. (1901.)
Gore, J. Howard. A bibliography of geodesy. Rept. 1887, app. 16, pp. 313-512.
Hilgard, J. E. On the use of railways in geodetic surveys. Rept. 1867, app. 9, pp. 140-144.
Kummell, Chas. A new solution of the geodetic problem. Rept. 1896, pt. 2, app. 7, pp. 293-303.
*See also* Arc measures—Azimuth—Base measurement—Constitution of the earth—Ellipticity of the earth—Figure of the earth—Geographic exploration—Geodetic conference—Gravity—Hydrography—Hypsometry—Instruments—International geodetic association—Latitude—Longitude—Plumb line deflection—Projection—Reconnaissance—Surveys—Tables—Topography—Triangulation.

**Geodetic conferences.**
Proceedings of the geodetic conference held at Washington, D. C., January 9 to February 28, 1894. Rept. 1893, pt. 2, app. 9, pp. 223-424.
*See also* International geodetic association.

**Geodetic instruments.**
*See* Base measuring apparatus—Chronograph—Heliotrope—Level—Leveling rods—Meridian instrument—Personal equation apparatus—Telegraph—Telescope—Theodolite—Transit—Zenith telescope.

**Geodetic leveling.** *See* Leveling.

**Geodetic positions.** *See* Geographic positions.

**Geographic exploration.** *See* Alaska—Atlantic coast—Columbus—Darien—Labrador—Mt. St. Elias—Northwest coast of America—Pacific coast—Panama.

**Geographic names.**
Ballard, E. Geographical names on the coast of Maine. Rept. 1868, app. 14,* pp. 243-259.

**Geographic positions.**
Doolittle, M. H. [Extension of Puissant's formulæ for computation of geodetic positions.] Rept. 1894, app. 9, p. 284, footnote.
Hayford, J. F. Extension of tables for the computation of geodetic positions to the equator. Rept. 1901, app. 4, pp. 303-339.
ALASKA. Davidson, G. Coast features and resources of Alaska territory. [List of geographic positions.] Rept. 1867, app. 18A,* pp. 265-274.
Schott, C. A. Standard geodetic positions in southeastern Alaska depending on astronomic observations in 1892, 1893, and 1894. Rept. 1894, pt. 2, app. 3,* pp. 71-85.
CONNECTICUT. Schott, C. A. Geographical positions of trigonometrical positions in the state of Connecticut, determined by the U. S. Coast and geodetic survey, 1833 to 1886. Rept. 1888, app. 8, pp. 313-403.
DISTRICT OF COLUMBIA. Preston, E. D. Establishment of the United States Naval observatory circle, and the determination of the geographical position of the center of the clock room. Rept. 1896, pt. 2, app. 6,* pp. 285-291.

---

* Exhausted.

MARYLAND. Bache, A. D., Pourtales, L. F., and Schott, C. A. Tides, currents, magnetic variation and geographic positions of light houses. Chesapeake bay and its rivers. Sep. pub. (1861.)*

MASSACHUSETTS. Geographic positions of trigonometric points in the state of Massachusetts, determined by the U. S. Coast and geodetic survey between the years 1843 and 1894, and including those determined by the survey made by Borden in the years 1832 and 1838. Rept. 1894, pt. 2, app. 10, p. 349–615.

Schott, C. A. Geographical positions of trigonometrical points in the states of Massachusetts and Rhode Island, 1835 to 1885, including those determined by the Borden survey, 1832 to 1838. Rept. 1885, app. 8, p. 285–439.

MEXICO. Schott, C. A. Results of observations for determining positions occupied in Lower California and at Philadelphia. Rept. 1874, app. 10,* pp. 131–133.

PACIFIC COAST. Additional geographical positions determined astronomically by the Coast survey on and near the western coast. Rept. 1874, app. 11,* p. 134.

Davidson, George. Directory for the Pacific coast of the United States (including geographical positions). Rept. 1862, app. 39,* pp. 268–430.

PENNSYLVANIA. Schott, C. A. Results of observations for determining positions occupied in Lower California and at Philadelphia. Rept. 1874, app. 10,* pp. 131–133.

RHODE ISLAND. Schott, C. A. Geographical positions of trigonometrical points in the states of Massachusetts and Rhode Island, 1835 to 1885, including those determined by the Borden survey, 1832 to 1838. Rept. 1885, app. 8, pp. 285–439.

——— Geographical positions of trigonometrical points in the states of Massachusetts and Rhode Island, 1835 to 1885, including those determined by the Borden survey, 1832 to 1838. Rept. 1894, pt. 2, app. 10, pp. 349–615.

UNITED STATES. List of geographical positions determined by the Coast survey. Rept. 1851, app. 12,* pp. 162–442.

List of geographical positions determined since July, 1850. Rept. 1853, app. 7,* pp. 14–42.

List of geographical positions. Rept. 1855, app. 8,* pp. 119–148.

List of geographical positions, continued. Rept. 1857, app. 25,* pp. 264–301.

List of geographical positions continued from reports of 1851, 1853, 1855 and 1857. Rept. 1859, app. 20,* pp. 216–277.

List of geographical positions. Rept. 1864, app. 15,* pp. 144–182.

Geographical positions determined approximately, in West Virginia, Kentucky, Tennessee, Alabama, Mississippi, and Missouri. Rept. 1865, app. 10,* p. 137.

List of geographical positions. Rept. 1868, app. 13, pp. 171–242.

Geographical positions of prominent places in the United States. Rept. 1874, app. 6, pp. 62–65.

VIRGINIA. Bache, A. D., Pourtales, L. F., and Schott, C. A. Tides, currents, magnetic variation and geographic positions of light-houses, Chesapeake bay and its rivers. Sep. pub. (1861.)*

*See also* Adjustment—Azimuth—Formulæ and factors—Latitude—Longitude.

**Geography.** *See* Boundaries—Eminent domain—Expeditions—Geodesy—Geographic exploration—Geographic names—Geo-physics—History—Hydrographic surveys—Maps—Relief models—Royal military geographic institute—Topographic surveys—Voyages.

**Geology.**

Agassiz, Louis. Relation of geological and zoological researches to general interests in the development of coast features. Rept. 1867, app. 17,* pp. 183–186.

Gilbert, G. K. Report on a geological examinat on of some Coast and geodetic survey gravity stations. Rept. 1894, pt. 2, app. 1, pp. 51–55.

Lindenkohl, A. Geology of the sea bottom in the approaches to New York bay. Rept. 1884, app. 13,* pp. 435–438.

ALASKA. Blake, T. A. Geology of Alaska territory. Rept. 1867, app. 18 E,* pp. 281–290.

CALIFORNIA. Blake, W. P. Observations on the physical geography and geology of the coast of California from Bodega bay to San Diego. Rept. 1855, app. 65,* pp. 376–398.

LABRADOR. Lieber, O. M. Geology of the coast of Labrador. Rept. 1860, app. 42,* pp. 402–408.

*See also* Earthquakes Gravity—Phosphates—Physical hydrographic surveys—Plumb line deflection—Relief models—Sand.

**Geo-Physics.** *See* Atmosphere—Atmospheric electricity—Auroras—Barometric hypsometry—Climate—Cyclones—Earthquakes—Geology—Hydrography—Meteorology—Phosphates—Refraction—Sand—Sun spots—Tornadoes—Water spouts—Winds.

**George's bank.**

Mitchell, H. Physical hydrography of the Gulf of Maine. Rept. 1879, app. 10,* pp. 175–190.

——— A plea for a light on St. George's bank. Rept. 1885, app. 11, pp. 483–485.

**Georgetown, D. C.** *See* Washington, D. C.

**Georgia.**

OYSTER BEDS. Drake, J. C. On the sounds and estuaries of Georgia with reference to oyster culture. Bull. 19. (1891.)

---

* Exhausted.

REFRACTION. Schott, C. A. Atmospheric refraction and adjustment of hypsometric measures. Determination of the coefficient of refraction from zenith distances observed in northern Georgia, by Assistants C. O. Boutelle and F. P. Webber, in 1873 and 1874, and adjustment of difference of heights by the method of least squares. Rept. 1876, app. 18, pp. 368-387.

TERRESTRIAL MAGNETISM. Schott, C. A. Distribution of the magnetic declination on the coasts of Virginia, South Carolina, and Georgia, with a chart of the isogonic curves for 1860. Rept. 1861, app. 24,* pp. 256-259.

*See also* Atlanta—Atlantic coast—Eastern oblique arc—Gulf Stream—Macon—Sapelo island—Savannah.

**Gerdes, Ferdinand H.**

Extract from a letter upon the change in the magnetic variation within short distances in the Gulf of Mexico. Rept. 1845, app. 3,* pp. 41-43.

Reconnaissance of the Florida keys. Rept. 1850, app. 23,* pp. 106-110.

Florida coast reconnaissance. Rept. 1851, app. 31,* pp. 488-494.

On a reconnaissance from Suwanee river, Florida, to the mouths of the Mississippi. Rept. 1852, app. 12,* pp. 87-94.

Reconnaissance of the coast of Louisiana in 1854. Rept. 1854, app. 20,* pp. 28-30.

Topography executed on Manhattan island. Rept. 1855, app. 21,* pp. 162, 163.

**Gibbs, Walcott.**

Analysis of the water of New York harbor. Rept. 1856, app. 63,* pp. 317, 318.

Examination of specimens of sand taken from the base sites at Cape Florida and Cape Sable. Rept. 1856, app. 64,* pp. 318, 319.

**Gibraltar, Mich.—Levels—Cincinnati, Ohio.**

Ferguson, O. W. Resulting elevations from spirit leveling between Gibraltar, Mich., Cincinnati, Ohio. Rept. 1899, app. 7, pp. 321-345.

**Gilbert, Grove Karl.**

Report on a geological examination of some Coast and geodetic survey gravity stations. Rept. 1894, pt. 2, app. 1, pp. 51-55.

**Gilbert, John J.**

(And Davidson, George.) Transit of Mercury as observed at Yolo base, California. Rept. 1883, app. 15,* pp. 369-370.

**Gilbert, Samuel A.**

Report on topography executed by the party of Assistant S. A. Gilbert on the western and southern sides of Long island. Rept. 1855, app. 22,* p. 164.

Coast of Texas intervening between Matagorda bay and Corpus Christi. Rept. 1859, app. 32,* pp. 324-328.

**Gilliss, J. Melville.**

Observations of the solar eclipse of July, 1860, near Fort Steilacoom, W. T. Rept. 1860, app. 22,* pp. 275-292.

**Gillmore, James Clarkson.** (Compiler.)

Magnetic ranges for determining the deviation of the compass in the Bay of San Francisco, Cal., with short explanations of how to find the deviation and error of the compass. Sp. pub. 1. (1898.)

**Girard college observatory, Philadelphia, Pa.**

Bache, A. D. Discussion of the magnetic and meteorological observations made at the Girard college observatory, Philadelphia, in 1841, 1842, 1843, 1844, and 1845.

Part I. Rept. 1859, app. 22,* pp. 278-295.
Part II. Rept. 1860, app. 23,* pp. 293-312.
Part III. Rept. 1860, app. 24,* pp. 312-324.
Part IV. Rept. 1862, app. 15,* pp. 161-186.
Part V. Rept. 1862, app. 16,* pp. 186-202.
Part VI. Rept. 1862, app. 17,* pp. 202-212.
Part VII. Rept. 1863, app. 19,* pp. 156-183.
Part VIII. Rept. 1863, app. 20,* pp. 183-195.
Part IX. Rept. 1863, app. 22,* pp. 196-204.
Part X. Rept. 1864, app. 16,* pp. 183-190.
Part XI. Rept. 1864, app. 17,* pp. 191-199.
Part XII. Rept. 1864, app. 18,* pp. 199-206.

**Glacier bay, Alas.** *See* Muir glacier, Alaska.

**Gloucester, N. J.—Levels—Keyport, N. J.**

Cutts, R. D. Leveling operations between Keyport on Raritan bay and Gloucester, on the Delaware river, to determine the heights above mean tide of the primary stations Beacon hill, Disboro, Stony hill, Mount Holly, and Pine hill. Rept. 1870, app. 7,* pp. 75, 76.

---

* Exhausted.

Cutts, R. D. Leveling operations between Keyport, on Raritan bay, and Gloucester, on the Delaware river, to determine the height above mean tide of the primary stations Beacon hill, Disboro, Stony hill, Mount Holly, and Pine hill. Rept. 1871, app. 12,* pp. 171–175.

**Goodfellow, Edward.**

Report on the determination of the magnetic elements on the eclipse expedition to Labrador. Rept. 1860, app. 21,* pp. 268–271.
Descriptive catalogue of publications relating to the Coast and geodetic survey and to standard measures. Rept. 1883, app. 6, pp. 121–135.
General index to the progress sketches and illustrations, maps and charts published in the annual reports of the U. S. Coast survey and U. S. Coast and geodetic survey from 1844 to 1885, inclusive. Rept. 1887, app. 12,* pp. 217–268.

**Gore, James Howard.**

A bibliography of geodesy. Rept. 1887, app. 16,* pp. 313–512.
(Translator.) On the measurement of base lines with steel tapes and with steel and brass wires. (By Edward Jädenin.) Rept. 1893, pt. 2, app. 5, pp. 125–164.

**Gould, Benjamin Apthorp.**

Results of observations for the determination of the difference of longitude between Seaton station, Washington, D. C., and Charleston, S. C. Rept. 1853, app. 33,* pp. 86–88.
On telegraphic observations for the difference of longitude between Raleigh, N. C., and Columbia, S. C. Rept. 1854, app. 41,* pp. 128–131.
Report containing directions and tables for the use of Peirce's criterion for the rejection of doubtful observations. Rept. 1854, app. 41[a],* pp. 131–138.
Telegraphic operations for difference of longitude between Columbia, S. C., and Macon, Ga. Rept. 1855, app. 46,* pp. 286–295.
Operations for difference of longitude between Wilmington, N. C., and Montgomery, Ala. Rept. 1856, app. 20,* pp. 163–166.
On the progress made in the different campaigns for differences of longitude. Rept. 1857, app. 27,* pp. 305–310.
Determination of longitude at Albany, N. Y. Rept. 1861, app. 18, pp. 221–232.
Observations of the solar eclipse of July, 1860, at Cambridge, Mass. Rept. 1861, app. 21, pp. 241, 242.
Longitude from observations by telegraph between Calais, Me., and New Orleans, La. Rept. 1862, app. 14,* pp. 158–160.
Standard mean right ascensions of circumpolar and time stars, prepared for the use of the U. S. Coast survey. First edition. Sep. pub. (1862.)*
On computations connected with the telegraphic method for difference of longitude. Rept. 1863, app. 18,* pp. 154–156.
On results of computation for longitude by telegraphic method. Rept. 1864, app. 12,* pp. 115, 116.
Report on the results of determining longitude by the telegraphic method. Rept. 1865, app. 14,* pp. 150, 151.
Report and tables of declinations and proper motions in declination of standard time stars. Rept. 1865, app. 15,* pp. 152–154.
Report and tables of the positions and proper motions of four polar stars. Rept. 1865, app. 16,* pp. 155–159.
Report on the latitude of Cloverden station in Cambridge. Rept. 1865, app. 17,* pp. 160–165.
Standard mean right ascension of circumpolar and time stars, prepared for the use of the U. S. Coast survey. Second edition. Sep. pub. (1866.)*
On the longitude between America and Europe from signals through the Atlantic cable. Rept. 1867, app. 6,* pp. 57–133.

**Governors.** *See* Marine governors—Spring governor.

**Governor's island, N. Y.**

Ferrel, William. On the harmonic analysis of the tides at Governor's island, New York harbor. Rept. 1885, app. 13, pp. 489–493.
*See also* New York harbor.

**Gowanus bay.** *See* New York harbor.

**Graduating apparatus.**

Saegmuller, G. N. Reconstruction of the dividing engine of the Coast and geodetic survey. Rept. 1879, app. 12,* pp. 192–198.

**Graphic methods.**

Gilliss, J. R. Dividers invented by J. R. Gilliss for graphical decomposition of tidal curves. Rept. 1860, app. 40,* pp. 398, 399.
Preston, E. D. Graphic method of reducing stars from mean to apparent places. Rept. 1895, pt. 2, app. 7,* pp. 371–380.

---

* Exhausted.

**Gravity.**

Report of a conference on gravity determinations held at Washington, D. C., in May, 1882. Rept. 1882, app. 22, pp. 503–516.

Gravity. (Leaflet printed for distribution at the Pan-American exposition, Buffalo, N. Y.) Sep. pub. (1901.)

Peirce, C. S. Measurements of gravity at initial stations in Europe and America. Rept. 1876, app. 15,* pp. 202–337.

Preston, E. D. Gravity. No. 5 in Bull. 29. (1893.)

Putnam, G. R. Relative determinations of gravity, with half-second pendulums, and other pendulum investigations. Rept. 1894, pt. 2, app. 1, pp. 7–50.

——— Results of pendulum observations made in 1895 and 1896. Rept. 1897, app. 6,* pp. 297–311.

——— Determination of relative value of gravity in Europe and the United States in 1900. Rept. 1901, app. 5, pp. 345–355.

Smith, Edwin. Determinations of gravity with the Kater pendulums at Auckland, New Zealand; Sydney, New South Wales; Singapore, Straits Settlements; Tokio, Japan; San Francisco, Cal.; and Washington, D. C. Rept. 1884, app. 14, pp. 439–473.

Africa. Preston, E. D. Results of observations made to determine gravity and the magnetic elements at stations on the west coast of Africa, and on some islands in the North and South Atlantic, 1889–1890. Rept. 1890, app. 12, pp. 625–684.

——— Same, abstract. Bull. 22. (1891.)

Alaska. Putnam, G. R. Physical observations made in connection with the Pribilof islands survey of 1897. Rept. 1898, app. 5,* pp. 233–241.

Atlantic islands. Preston, E. D. Results of observations made to determine gravity and the magnetic elements at stations on the west coast of Africa, and on some islands in the north and South Atlantic, 1889–1890. Bull. 22. (1891.)

Caroline island. Preston, E. D. Determinations of gravity and other observations made in connection with the solar eclipse expedition, May, 1883, to Caroline island. Rept. 1883, app. 17,* pp. 379–381.

——— Determinations of latitude and gravity for the Hawaiian government. Rept. 1888, app. 14, pp. 471–563.

——— Same, abstract. Bull. 11. (1889.)

France. Peirce, C. S. On the value of gravity at Paris. Rept. 1881, app. 17, pp. 461–463.

Hawaii. Preston, E. D. Determinations of latitude and gravity for the Hawaiian government. Rept. 1888, app. 14, pp. 471–563.

——— Same, abstract. Bull. 11. (1889.)

——— Observations for the variation of latitude, made near Honolulu, Oahu, Hawaiian islands, in co-operation with the work of the International geodetic association, and on the determination of gravity and of the magnetic elements. Rept. 1891, pt. 2, app. 13, pp. 479–485.

——— Determinations of latitude, gravity, and magnetic elements at stations in the Hawaiian islands, including a result for the mean density of the earth, 1891, 1892. Rept. 1893, pt. 2, app. 12, pp. 509–638.

Maryland. Preston, E. D. Telegraphic determination of the force of gravity at Baltimore, Md., from simultaneous pendulum observations at Washington and Baltimore. Rept. 1894, pt. 2, app. 2, pp. 57–70.

Massachusetts. Smith, Edwin. Determinations of gravity at the Polytechnic institute, Worcester, Mass., and at Columbia university, New York, with pendulum apparatus B. Rept. 1899, app. 4, pp. 271–282.

New York. Smith, Edwin. Determinations of gravity at the Polytechnic institute, Worcester, Mass., and at Columbia university, New York city, with pendulum apparatus B. 1899. Rept. 1899, app. 4, pp. 271–282.

New Zealand. Smith, Edwin. Determinations of gravity with the Kater pendulums at Auckland, New Zealand; Sydney, New South Wales; Singapore, British India; Tokio, Japan; San Francisco, Cal.; and Washington, D. C. Rept. 1884, app. 14, pp. 439–473.

Pennsylvania. Pierce, C. S. Determinations of gravity at Allegheny, Ebensburg, and York. Rept. 1883, app. 19, pp. 473–487.

United States. Putnam, G. R. Determination of relative value of gravity in Europe and the United States in 1900. Rept. 1901, app. 5, pp. 345–355.

Mendenhall, T. C. Determinations of gravity with the new half-second pendulums of the Coast and geodetic survey at stations on the Pacific coast, in Alaska, and at the base stations, Washington, D. C., and Hoboken, N. J. Rept. 1891, pt. 2, app. 15, pp. 503–564.

Putnam, G. R., and Gilbert, G. K. Relative determinations of gravity with half-second pendulums, and other pendulum investigations by G. R. Putnam, and a report on a geological examination of some Coast and geodetic survey gravity stations by G. K. Gilbert, United States Geological survey. Rept. 1894, pt. 2, app. 1, pp. 7–55.

*See also* Figure of the Earth—Geodesy—Pendulum—Plumb line deflection.

**Great Britain.**

Hilgard, J. E. The relation of the lawful standards of measure of the United States to those of Great Britain and France. Rept. 1876, app. 22, pp. 402–406.

**Greely arctic expedition.**

Schott, C. A. Magnetic work of the Greely arctic expedition. Rept. 1887, app. 10, pp. 207–210.

---

* Exhausted.

**Greenland expedition.**

Putnam, G. R. Results of magnetic observations made in connection with the Greenland expedition of 1896, under charge of Prof. A. E. Burton. Rept. 1897, pt. 2, app. 5, pp. 285–295.

**Greenwell, W. E.**

General features and peculiarities of the coast of lower Texas with suggestions in regard to facilities for navigation. Rept. 1854, app. 21,* pp. 30, 31.

Survey, character and resources of the islands and main adjacent to Santa Barbara channel, California. Rept. 1857, app. 44,* pp. 392–395.

**Greenwich, Eng.—Longitude—Philadelphia, Pa.**

Walker, S. C. Differences of longitude of Philadelphia and Greenwich, by reduction of observations at Cambridge, Mass. Rept. 1846, app. 10,* pp. 71, 72.

**Gulf coast of the United States.**

CURRENTS. Current bottles from Mobile bay to Mosquito inlet and Cape Florida to Jupiter inlet. Rept. 1854, app. 52,* pp. 189, 190.

HISTORY. Kohl, J. G. Abstract of an historical account of explorations on the coast of the Gulf of Mexico. Rept. 1856, app. 66,* pp. 322–324.

RECONNAISSANCE. Gerdes, F. H. On a reconnaissance from Suwanee river, Florida, to the mouths of the Mississippi. Rept. 1852, app. 12,* pp. 87–94.

LEVELING. Schott, Chas. A. Heights from spirit levelings of precision between Mobile, Ala., and Carrollton, La. Rept. 1887, app. 9, pp. 185–205.

METEOROLOGY. Bache, A. D. Winds of the coast of the United States on the Gulf of Mexico. Rept. 1856, app. 44,* pp. 272–276.

TERRESTRIAL MAGNETISM. Schott, C. A. Discussion of the secular change in the magnetic declination on the Atlantic and part of the Gulf coasts of the United States. Rept. 1855, app. 48,* pp. 306–337.

——— Distribution of the magnetic declination on the coast of the Gulf of Mexico, with a chart of the isogonic curves for 1860. Rept. 1861, app. 23, pp. 251–256.

TIDES. Bache, A. D. Approximate cotidal lines of diurnal and semidiurnal tides of the coast of the United States on the Gulf of Mexico. Rept. 1856, app. 35,* pp. 252–260.

*See also* Gulf Stream.

**Gulf of Maine.**

Mitchell, H. Physical hydrography of the Gulf of Maine. Rept. 1879, app. 10,* pp. 175–190.

*See also* Atlantic ocean—Atlantic coast.

**Gulf Stream and Gulf of Mexico.**

Bache, A. D. Gulf Stream. Rept. 1860, app. 17,* pp. 165–176.

Bache, George M. Letters on the exploration of the Gulf Stream. Rept. 1846, app. 4,* pp. 46–53.

Hunt, E. B. Some anomalies in the Florida Gulf Stream. Rept. 1858, app. 32,* pp. 217–222.

Kohl, J. G. History of discovery and exploration on the coasts of the United States. Rept. 1884, app. 19,* pp. 493–617.

Mitchell, H. Note on Gulf Stream observations. Rept. 1868, app. 11,* pp. 166, 167.

CURRENT. Current bottle, Mobile bay to Mosquito inlet and Cape Florida to Jupiter inlet. Rept. 1854, app. 52,* pp. 189, 190.

Copy of cards from current bottles thrown over south of the Mississippi delta. Rept. 1856, app. 46,* pp. 279–280.

Velocity and direction of the Gulf Stream between Fowey rocks, Florida, and Gun Cay, Bahamas. Notice to mariners 78. (1886.)

Gulf stream currents. Notice to mariners 94. (1887.)

Haskell, E. E. On observations of currents with the direction-current meter in the Straits oj Florida and in the Gulf of Mexico, 1891. Rept. 1891, pt. 2, app. 10, pp. 343–364.

Pillsbury, J. E. Report on deep-sea current work in the Gulf Stream. Rept. 1885, app. 14, pp. 495–501.

——— A report on Gulf Stream explorations. Rept. 1886, app. 11, pp. 281–290.

——— Gulf Stream explorations; observations of currents, 1887. Rept. 1887, app. 8, pp. 173–184.

——— Gulf Stream explorations; observations of currents, 1888–1889. Rept. 1889, app. 16, pp. 467–477.

DENSITY. Lindenkohl, A. Specific gravity of the waters of the Gulf of Mexico and the Gulf Stream. Rept. 1895, pt. 2, app. 6,* pp. 355–369.

DREDGINGS. Agassiz, L. Report upon deep sea dredgings in the Gulf Stream during the third cruise of the United States steamer Bibb. Rept. 1869, app. 10,* pp. 208–219.

Bailey, J. W. Characteristics of the Florida section of the Gulf Stream from bottom soundings. Rept. 1855, app. 55,* p. 360.

Pourtales, L. F. Examination of specimens of bottom obtained in Gulf Stream. Rept. 1853, app. 30,* pp. 82, 83.

——— Characteristics of the Atlantic sea bottom off the coast of the United States. Rept. 1869, app. 11,* pp. 220–225.

——— Fauna of the Gulf Stream. Rept. 1867, app. 16,* pp. 180–182.

Hilgard, J. E. Description of a model of the depths of the sea in the Bay of North America and Gulf of Mexico. Rept. 1884, app. 17, pp. 619–621.

SOUNDING. Mitchell, H. Soundings across the Florida straits. Rept. 1866, app. 5,* pp. 35–44.

---

*Exhausted.

SOUNDING. Report on soundings made to develop the character of the Strait of Florida between Key West and Havana. Rept. 1867, app. 15,* pp. 176–179.

Pillsbury, J. E. Recent deep-sea soundings off the Atlantic coast of the United States. Rept. 1882, app. 19,* pp. 459–461.

——— A description of the methods employed in the investigation of the Gulf Stream and the results of the research. Rept. 1890, app. 10, pp. 461–620.

TEMPERATURE. Bache, A. D. On the distribution of temperatures in and near the Gulf Stream. Rept. 1854, app. 47,* pp. 156–161.

——— Gulf Stream explorations; third memoir. Distribution of temperature in the water of the Florida channel and straits. Rept. 1859, app. 25,* pp. 306–310.

TERRESTIRAL MAGNETISM. Gerdes, F. H. Remarks upon the currents in Mississippi sound and upon the change in the magnetic variation within short distances in the Gulf of Mexico. Rept. 1845, app. 3,* pp. 41–43.

TIDES. Bache, A. D. Tidal observations in the Gulf of Mexico and type curves at the several stations, showing their decomposition into diurnal and semidiurnal tides. Rept. 1855, app. 52,* pp. 346, 347.

——— Type curves in the Gulf of Mexico. Rept. 1856, app. 36,* pp. 260, 261.

——— Additional researches on cotidal lines in the Gulf of Mexico. Rept. 1862, app. 9,* pp. 126–128.

*See also* Alabama—Atlantic ocean—Caribbean sea—Cat island—Florida—Gulf coast Louisiana—Texas.

**Gunstock mountain, N. H.**

Bache, A. D. Observations of solar eclipse of July, 1860, at Gunstock mountain, N. H. Rept. 1861, app. 19, pp. 232–239.

**Hagerstown, Md.—Levels—Washington, D. C.**

Schott, C. A. Resulting heights from spirit leveling between Washington, D. C., and Hagerstown, Md., 1883. Rept. 1896, pt. 2, app. 4, pp. 261–264.

**Halifax, N. S.—Longitude—Cambridge, Mass.**

Walker, S. C. Arrangement with Maine telegraph company to determine the difference of longitude between Cambridge and Halifax. Rept. 1851, app. 18,* pp. 462, 463.

**Hamilton, Mt., Cal.** *See* Mt. Hamilton.

**Harbors.**

Batchelder, J. M. Apparatus for harbor soundings proposed by E. B. Hunt. Rept. 1858, app. 38,* pp. 247, 248.

Davidson, George. Observations on certain harbor and river improvements collected on a voyage from Hongkong to New York. Rept. 1875, app. 18,* pp. 293–314.

Hilgard, J. E. On tides and tidal action in harbors. Sep. pub. (1876.)*

Mitchell, Henry. Location of harbor lines. Rept. 1871, app. 10,* pp. 144–153.

Whiting, W. D., and Pourtales, L. F. Least water in channel entrances of harbors, rivers, ports, and anchorages on the coasts of the United States. Rept. 1856, app. 18,* pp. 133–137.

*See also* Anchorages—Bars—Channels—Coast pilot Currents—Depths—Hydrographic surveys—Hydraulic engineering—Piers—Shore line changes—Sounding—Tides. *See also* Harbors of Beaufort, S. C.; Boston, Mass.; Cat island, Miss.; Charleston, S. C.; Edgartown, Mass.; Martha's Vineyard, Mass.; Nantucket, Mass.; New York, N. Y.; Philadelphia, Pa.; Plymouth, Mass.; Portland, Me.; Provincetown, Mass.; San Francisco, Cal.

**Harford, W. G. W.**

Zoology of Alaska territory. Rept. 1867, app. 18F,* pp. 290–292.

**Harmonic analysis.**

Ferrel, William. Tides in Penobscot bay. Rept. 1878, app. 11, pp. 268–304.

——— Harmonic analysis of the tides at Sandy Hook. Rept. 1883, app. 9, pp. 247–251.

——— On the harmonic analysis of the tides at Governor's island, New York harbor. Rept. 1885, app. 13, pp. 489–493.

Harris, Rollin A. Manual of tides. Part III. Some connections between harmonic and nonharmonic quantities, including applications to the reduction and prediction of tides. Rept. 1894, pt. 2, app. 7, pp. 125–262.

——— Manual of tides. Part II. Tidal observation, equilibrium theory, and harmonic analysis. Rept. 1897, pt. 2, app. 9, pp. 471–618.

*See also* Tides.

**Harris, Rollin Arthur.**

Manual of tides. Part III. Some connections between harmonic and nonharmonic quantities, including applications to the reduction and prediction of tides. Rept. 1894, pt. 2, app. 7, pp. 125–262.

Manual of tides. Part I. Introduction and historical treatment of the subject. Rept. 1897, pt. 2, app. 8, pp. 319–469.

Manual of tides. Part II. Tidal observation, equilibrium theory, and harmonic analysis. Rept. 1897, pt. 2, app. 9, pp. 471–618.

Manual of tides. Part IVa. Outlines of tidal theory. Rept. 1900, app. 7, pp. 535–700.

---

*Exhausted.

**Harrison, Alexander Medina.**
Topography on the coast of New Jersey, including Sandy Hook. Rept. 1855, app. 23,* pp. 164, 165.
On the plane table and its use in topographical surveying. Rept. 1865, app. 22, pp. 203–231.

**Harrison's lens.**
Hilgard, J. E. On the trial of Harrison's globe lens previous to its use in the photograph division. Rept. 1863, app. 24,* pp. 206, 207.

**Harvard college observatory.** *See* Cambridge, Mass.

**Haskell, Eugene E.**
On observations of currents with the direction-current meter in the Straits of Florida and in the Gulf of Mexico, 1891. Rept. 1891, pt. 2, app. 10, pp. 343–364.
(And Christie, A. G.) Tides and currents. No. 9 in Bull. 29. (1893.)

**Hassler, Ferdinand Rudolph.** *See*, as Superintendent, Reports and other Survey publications, 1816–1843.

**Hassler (steamer).**
Emery, Chas. E. Economy in coal as exemplified by the action of compound engines in the steamer Hassler. Rept. 1874, app. 13,* pp. 148–151.
Pourtales, L. F. Voyage of the steamer Hassler from Boston to San Francisco. Rept. 1872, app. 11,* pp. 213–221.

**Hatboro, Pa.**
Schott, C. A. Intermediate period in the secular change of magnetic declination at Hatboro, Penn. Rept. 1858, app. 25,* pp. 192–195.

**Hawaii.**
Preston, E. D. Determinations of latitude and gravity for the Hawaiian government. Rept. 1888, app. 14, pp. 471–563.
——— Same, abstract. Bull. 11. (1889.)
——— Determinations of latitude, gravity and magnetic elements at stations in the Hawaiian islands, including a result for the mean density of the earth, 1891, 1892. Rept. 1893, pt. 2, app. 12, pp. 509–638.
*See also* Honolulu, Waikiki.

**Hayford, John Fillmore.**
On the use of observations of currents for prediction purposes. Rept. 1890, app. 14,* pp. 691–703.
On the least square adjustment of weighings. Rept. 1892, pt. 2, app. 10, pp. 515–527.
The Rueprecht balance belonging to the United States office of standard weights and measures. Rept. 1895, pt. 2, app. 9,* pp. 383–392.
Determination of time, longitude, latitude and azimuth. Rept. 1898, app. 7, pp. 261–409.
Precise leveling in the United States. Rept. 1899, app. 8, pp. 347–886.
Preface to appendix on the measurement of nine base lines along the ninety-eighth meridian. Rept. 1901, app. 3, pp. 229–302.
Extension of tables for the computation of geodetic positions to the equator. Rept. 1901, app. 4, pp. 303–339.
Triangulation northward along the ninety-eighth meridian in Kansas and Nebraska. Rept. 1901, app. 6, pp. 357–423.

**Hazard, Daniel Lyman.**
(And Baylor, J. B.) General report upon the magnetic survey of North Carolina, with a brief historical sketch of the fundamental phenomena of the earth's magnetism. Rept. 1899, app. 9, pp. 887–938.
Magnetic survey of North Carolina. Values of the magnetic declination at the county seats from 1750 to 1910. Bull. 41. (1901.)

**Heights.** *See* Barometer—Elevations—Leveling.

**Hein, Samuel.**
General rules for estimates, accounts, and classification of expenditures for the guidance of the chiefs of parties of the U. S. Coast survey. Laws and regulations. (1858.)*
General rules for estimates, accounts, and classification of expenditures for the guidance of the chiefs of parties of the United States Coast survey, 1874. Laws and regulations. (1874.)*

**Heis catalogue.** *See* Star catalogue.

**Heliotrope.**
Sands, B. F. Description of the revolving heliotrope devised by him for geodetic purposes. Rept. 1855, app. 59, p. 364.
*See also* Signals.

**Hell Gate, N. Y.**
Bartlett, W. A. Examination of reefs in Hell Gate channel and changes produced by blasting. Rept. 1851, app. 56,* pp. 553–558.

---

*Exhausted.

Mitchell, H. Tides and currents in Nantucket and Martha's Vineyard sounds and in East river at Hell Gate, with remarks on the revision of leveling on Hudson river. Rept. 1857, app. 35,* pp. 350–354.

——— Currents in the East river at Hell Gate and Throg's Neck, the sub-currents of New York bay and harbor, and levelings on the banks of the Hudson river. Rept. 1858, app. 28, pp. 204-207.

——— Preliminary report on the interference tides of Hell Gate, with directions for reducing the soundings. Rept. 1866, app. 6,* pp. 44-46.

——— Tides and currents of Hell Gate, N. Y. Rept. 1867, app. 13,* pp. 158-169.

Schott, C. A. Tidal currents of Long Island sound and approaches. Rept. 1854, app. 50,* pp. 168–179.

Temple, W. G. Results of examination to determine least water on the rocks at Hell Gate, East river, New York. Rept. 1857, app. 13,* pp. 150, 151.

*See also* New York—Pot rock.

**Hellert's expedition.**

Davidson, G. Condensed account of M. Hellert's explorations on the Isthmus of Panama, including his special explorations on the Isthmus of Darien, with suggestions for conducting a future survey. Rept. 1868, app. 15,* pp. 260–277.

**Hergesheimer, Edwin.**

Experiments to determine the relative shrinkage and expansion of parchment paper and backed antiquarian paper. Rept. 1861, app. 15,* pp. 180, 181.

The pantograph; its use in engraving. Rept. 1867, app. 5,* pp. 55, 56.

Preparation of standard topographical drawings. Rept. 1879, app. 11,* p. 191.

A treatise on the plane table and its use in topographical surveying. Rept. 1880, app. 13,* pp. 172–200.

Type forms of topography, Columbia river. Rept. 1881, app. 7, pp. 124, 125.

Report on the preparation of standard topographical drawings. Rept. 1883, app. 14,* pp. 367, 368.

**Hetzel (steamer).**

Causes which led to the explosion of a boiler of the Coast survey steamer Hetzel. Rept. 1856, app. 70,* pp. 335-340.

Hewston, J., jr. Analysis of two specimens of deposit from the boiler of the Coast survey steamer Hetzel. Rept. 1853, app. 35,* pp. 89, 90.

**Hewston, John, jr.**

Analysis of two specimens of deposit from the boiler of the Coast survey steamer Hetzel. Rept. 1853, app. 35,* pp. 89, 90.

**Hilgard, Julius Erasmus.**

Discussion of probable error of observation with a Würdemann 26-inch portable transit. Rept. 1854, app. 39,* p. 121.

On the action of sea water on metals used in the construction of instruments and on magnetic needles. Rept. 1854, app. 55,* pp. 192, 193.

(And Bache, A. D.) Table of magnetic declinations from Coast survey observations. Rept. 1855, app. 47,* pp. 295–306.

Method of observing azimuth, employed at Cat island. Rept. 1856, app. 27,* pp. 208, 209.

(And Bache, A. D.) On the general distribution of terrestrial magnetism in the United States. Rept. 1856, app. 28,* pp. 209–225.

Progress of the triangulation in Mississippi sound and on Lake Borgne, describing signals and station marks. Rept. 1856, app. 56,* pp. 291, 292.

Table for projecting maps of large extent [and minimum distortion in represented area]. Rept. 1856, app. 58,* pp. 296–307.

Method of testing a repeating theodolite. Rept. 1856, app. 61, pp. 310–316.

Apparatus for observing subsidiary base lines. Rept. 1857, app. 45,* pp. 395–398.

Tables for projecting maps of large extent. Rept. 1859, app. 33,* pp. 328–358.

Description of a new mode of constructing the axle of a magnetic dipping needle. Rept. 1862, app. 23,* pp. 236–238.

Results of experiments for determining the length and rate of expansion of the six meter standard bar. Rept. 1862, app. 26,* pp. 248–255.

On the trial of Harrison's globe lens previous to its use in the photographic division. Rept. 1863, app. 24,* pp. 206, 207.

On the use of railways for geodetic surveys. Rept. 1867, app. 9, pp. 140–144.

Description of a reflector used as a signal in triangulation. Rept. 1867, app. 10,* p. 145.

Report of the observations of the eclipse of the sun on August 7, 1869, made by a party of the Coast survey at Des Moines, Ia., under the charge of J. E. Hilgard. Rept. 1869, app. 8, pp. 163–177.

On the use of the zenith telescope for observations of time. Rept. 1869, app. 12, pp. 226–232.

Earthquake wave of August 18, 1868. Rept. 1869, app. 13, pp. 233, 234.

Preliminary report on the determination of transatlantic longitudes. Rept. 1872, app. 13,* pp. 227–234.

Intervisibility of stations. Rept. 1873, app. 13,* p. 137.

Ocean salinometer. Rept. 1874, app. 16,* pp. 154, 155.

---

* Exhausted.

Two forms of portable apparatus for the determination of personal equation, both relative and absolute. Rept. 1874, app. 17,* pp. 156–162.
Transatlantic longitudes. Final report on the determination of 1872 with a review of previous determinations. Rept. 1874, app. 18, pp. 163–242.
On tides and tidal action in harbors. Sep. pub. (1876.)*
A catalogue of stars for observations of latitude. Rept. 1876, app. 7, pp. 83–129.
On a chart of the magnetic declination in the United States. Rept. 1876, app. 21,* pp. 400, 401.
The relations of the lawful standards of measure of the United States to those of Great Britain and France. Rept. 1876, app. 22, pp. 402–406.
Papers relating to metric standards distributed to the States of the Union under a joint resolution of Congress of July 27, 1866. Sep. pub. (1876.)
Optical densimeter for ocean water. Rept. 1877, app. 10, pp. 108–113.
An examination of three new 20-inch theodolites. Rept. 1877, app. 11, pp. 114–147.
Comparison of American and British standard yards. Rept. 1877, app. 12, pp. 148–181.
Perfected form of the contact slide base apparatus used in the Coast and geodetic survey. Rept. 1880, app. 17, pp. 341–345.
On the length of a nautical mile. Rept. 1881, app. 12, pp. 354–356.
(And Blair, H. W.) Records and results of magnetic observations made at the charge of the "Bache fund" of the National academy of sciences from 1871 to 1876. Rept. 1882, app. 14, pp. 329–426.
Report of the Superintendent of the United States Coast and geodetic survey for the fiscal year ending with June, 1882. Report submitting estimates. (1882.) †
Letter of the Superintendent on the proposed transfer to the Navy department. Sep. pub. (1883.)
Summary report of the United States Coast and geodetic survey for the fiscal year ending with June, 1883. Reports submitting estimates. (1884.) †
General instructions for hydrographic work. Instructions in methods. (1883.) †
Summary report of the progress of the United States Coast and geodetic survey for the fiscal year ending with June, 1884. Reports submitting estimates. (1884.) †
Description of a model of the depths of the sea in the Bay of North America and the Gulf of Mexico. Rept. 1884, app. 17, pp. 619–621.
*See also*, as Acting superintendent, Reports and other Survey publications, 1865, 1866, and, as Superintendent, the same for 1881–1884.

**Hipp chronograph.**
Eimbeck, William. Improvement on the Hipp chronograph. Rept. 1872, app. 18,* pp. 266, 267.

**History.**
ALASKA. Dall, W. H. Notes on an original manuscript chart of Bering's expedition of 1725–30 and on an original manuscript chart of his second expedition; together with a summary of a journal of the first expedition kept by Peter Chaplin and now first rendered into English from Bergh's Russian version. Rept. 1890, app. 19, pp. 759–774.
AMERICA. Davidson, George. An examination of some of the early voyages of discovery and exploration on the northwest coast of America from 1539 to 1603. Rept. 1886, app. 7, pp. 155–253.
Fox, G. V. An attempt to solve the problem of the first landing place of Columbus in the New world. Rept. 1880, app. 18, pp. 346–411.
Schott, C. A. Variation of the compass off the Bahama islands at the time of the landfall of Columbus in 1492. Rept. 1880, app. 19, pp. 412–417.
COAST AND GEODETIC SURVEY. Historical sketch of the U. S. Coast and geodetic survey. Sep. pub. (1884?)*
Historical compilation, U. S. Coast and geodetic survey. Sep. pub. (1887?)*
Schott, C. A. Historical review of the work of the Coast and geodetic survey in connection with terrestrial magnetism. Rept. 1888, app. 6,* pt. 2, pp. 171–176.
UNITED STATES COAST. Kohl, J. G. Abstract of a complete historical account of the progress of discovery on the western coast of the United States from the earliest period. Rept. 1855, app. 64,* pp. 374–375.
——— Abstract of a historical memoir concerning the progress of exploration on the Atlantic coast of the United States. Rept. 1856, app. 65,* pp. 319–322.
——— Abstract of an historical account of explorations made on the coast of the Gulf of Mexico. Rept. 1856, app. 66,* pp. 322–324.
——— Western coast annals of maritime discovery and exploration. Rept. 1857, app. 52,* pp. 414–433.
——— History of discovery and exploration on the coasts of the United States. Rept. 1884, app. 19,* pp. 495–617.
Davidson, George. Magnetic variations off the coasts of California and Mexico observed by Spanish navigators in the last quarter of the eighteenth century. Rept. 1885, app. 7, pp. 275–284.
*See also* Charts—Expeditions—Maps—Voyages.

**Hoboken, N. J.**
Mendenhall, T. C. Determinations of gravity with the new half-second pendulums of the Coast and geodetic survey at stations on the Pacific coast, in Alaska, and at the base stations, Washington, D. C., and Hoboken, N. J. Rept. 1891, pt. 2, app. 15, pp. 503–564.

---

* Exhausted. † Not for general distribution.

**Hodgkins, William Candler.**
An historical account of the boundary line between the states of Pennsylvania and Delaware. Part I, in Rept. 1893, pt. 2, app. 8, pt. I, pp. 177-202.
Detailed account of work on the Pennsylvania and Delaware boundary. Part II, in Rept. 1893, pt. 2, app. 8, pt. II, pp. 202-222.
Triangulation and reconnaissance. No. 3 in Bull. 29. (1893.)

**Hog island, Potomac river.**
Report in relation to a portion of boundary line in dispute between the states of Maryland and Virginia. Rept. 1890, app. 11, pp. 621-623.

**Holliday, Kans.—Levels—Jefferson City, Mo.**
Schott, C. A. Resulting heights from spirit leveling between Jefferson City, Mo., and Holliday, Kans., 1891. Rept. 1896, pt. 2, app. 5, pp. 265-284.

**Holliday, Kans.—Levels—Salina, Kans.**
Schott, C.A. Resulting heights from spirit leveling between Holliday and Salina, Kans. Rept. 1897, pt. 2, app. 4, pp. 269-283.

**Holton base, Ind.**
On the measurement of the Holton base, Holton, Ripley county, Ind., and the St. Albans base, Kanawha county, W. Va. Rept. 1892, pt. 2, app. 8, pp. 329-503.
Schott, C. A. Length of the Holton base line, Ind., with related experimental measures. Rept. 1894, pt. 2, app. 5,* pp. 101-116.

**Honolulu, Hawaii.**
Preston, E. D. Observations for the variation of latitude, made near Honolulu, Oahu, Hawaiian islands, in co-operation with the International geodetic association and on the determination of gravity and the magnetic elements. Rept. 1891, pt. 2, app. 13, pp. 479-485.
——— Determination of the constant of aberration from latitude observations with the zenith telescope at Honolulu, H. I., and San Francisco, Cal. Rept. 1896, pt. 2, app. 10, pp. 353-371.
*See also* Waikiki.

**Horizons.** *See* Artificial horizons.

**Horizontal measures.**
Bache, A. D. Comparison of the reduction of horizontal angles by the methods of "dependent directions" and of "dependent angular quantities" by the method of least squares. Rept. 1854, app. 33,* pp. 63-95.
Schott, C. A. Adjustment of horizontal angles of a triangulation. Probable error of observation, derived from observations of horizontal angles at any single station and depending on directions. Rept. 1854, app. 33S,* pp. 70-86.
——— The problem of determining a position by angles observed upon a number of given stations. Solution of Gauss, with example. Rept. 1864, app. 13,* pp. 116-119.
——— Adaptation of triangulations to various conditions, depending on the configuration of a country and on the degree of accuracy aimed at, with due consideration of the time and means available; also method of observing horizontal angles and directions in geodetic surveys. Rept. 1871, app. 15,* pp. 185-188.
——— Same, with additions. Rept. 1876, app. 20, pp. 391-399.
*See also* Micrometric measures—Triangulation.

**Horizontal intensity, magnetic.** *See* Magnetic intensity.

**Hour angles.** *See* Azimuth.

**Hudson river.**
Mitchell, H. Tides and currents in Martha's Vineyard and Nantucket sounds and in East river at Hell Gate with remarks on the revision of levelings on Hudson river. Report 1857, app. 35,* pp. 350-354.
——— Currents in the East river at Hell Gate and Throg's Neck, the sub-currents of New York bay and harbor and levelings on the banks of the Hudson river. Rept. 1858, app. 28, pp. 204-207.
——— Report on the results of the physical surveys of New York harbor. Rept. 1887, app. 15, pp. 301-311.
Würdemann, G. On tidal observations made between New York city and Albany. Rept. 1856, app. 40,* pp. 266, 267.
*See also* Dobbs Ferry—New York harbor.

**Hudson river fiord.**
Lindenkohl, A. Geology of the sea bottom in the approaches to New York bay. Rept. 1884, app. 13,* pp. 435-438.

**Huger, Thomas B.**
Comparison of hydrographic surveys at the entrance to Cape Fear river. Rept. 1858, app. 13,* pp. 150, 151.

---

*Exhausted.

**Hugo, Colo.—Levels—Colorado Springs, Colo.**

Schott, C. A. Resulting heights from spirit leveling between Hugo and Colorado Springs, Col. Rept. 1898, app. 3, pp. 215–228.

**Hugo, Colo.—Levels—Ellis, Kans.**

Schott, C. A. Resulting heights from spirit leveling between Ellis, Kans., and Hugo, Col. Rept. 1898, app. 2, pp. 195–214.

**Humboldt bay, Cal.**

Trinidad, Humboldt and San Diego bays. Rept. 1851, app. 50, pp. 528–530.

**Hunt, Edwin B.**

Notes on lithography and lithographic transfers. Rept. 1853, app. 36,* pp. 90–93.

Aligning reflector or interranger, Hunt's. Rept. 1853, app. 37,* pp. 93, 94.

Self-registering tide gauge, Saxton's. Rept. 1853, app. 38,* pp. 94–96.

(And Schott, C. A.) Tables for projecting maps, with notes on map projections. Rept. 1853, app. 39,* pp. 96–163.

Description of Coast survey apparatus for measuring base lines. Rept. 1854, app. 35,* pp. 103–108.

Report on engraving in relation to the Coast survey. Rept. 1854, app. 57,* pp. 201–212.

Report on an index of reference to memoirs and papers on subjects related to the Coast survey operations. Rept. 1856, app. 67,* pp. 325–330.

On systematizing the abbreviations of titles of periodicals, transactions, etc. Rept. 1856, app. 68,* pp. 331–333.

Deep-sea sounding apparatus. Rept. 1857, app. 47,* pp. 398–401.

Preparation of an index of scientific references. Rept. 1857, app. 51,* pp. 404–414.

Dynamics of ocean currents. Rept. 1858, app. 31,* pp. 213–216.

Some anomalies in the Florida Gulf Stream. Rept. 1858, app. 32,* pp. 217–222.

Origin, growth, substructure, and chronology of the Florida reef. Rept. 1862, app. 25,* pp. 241–248.

Titles of scientific papers communicated by the late Major E. B. Hunt, United States Engineers, and published either in the Coast survey reports or with the proceedings of the American association for the advancement of science. Rept. 1863, app. 25,* pp. 207, 208.

Description of the compensation base apparatus of the United States Coast survey. Rept. 1873, app. 12,* [pt. II] pp. 132–136.

**Hydraulic engineering.**

Davidson, G. Observations on certain harbors and river improvements collected on a voyage from Hongkong, via Suez, to New York. Rept. 1875, app. 18,* pp. 293–314.

*See also* Canals—Harbors—Hydrography—Levees—Light-houses—Piers—Rivers.

**Hydraulics.**

Hunt, E. B. Dynamics of ocean currents. Rept. 1858, app. 31,* pp. 213–216.

Peirce, Benjamin. Cotidal lines of an inclosed sea derived from the equilibrium theory. Rept. 1858, app. 30,* pp. 210–213.

*See also* Currents—Motion—Physical hydrography—Tides.

**Hydrographic changes.** *See* Physical hydrography.

**Hydrographic instruments.** *See* Current float—Current meter—Depth recorder—Dredging apparatus—Hydrometer—Log—Sounding apparatus—Thermometer—Tide gauge—Tide indicator—Tide predicting machine.

**Hydrographic reconnaissance.**

CALIFORNIA. McArthur, W. P. Report accompanying a reconnaissance chart of the western coast of the United States, from Monterey, Cal., to the Columbia river, Oregon. Rept. 1850, app. 31,* pp. 119–121.

Alden, James. Reconnaissance from San Francisco to San Diego, including Santa Barbara islands and channel. Rept. 1852, app. 18,* pp. 104–107.

Johnson, W. M. Features of Santa Cruz island, the valley of San Buenaventura, and the coast north of Santa Barbara channel. Rept. 1855, app. 28,* pp. 186–188.

——— Topographical features of the coast adjacent to Santa Barbara channel. Rept. 1857, app. 43,* pp. 390, 391.

FLORIDA. Gerdes, F. H. Reconnaissance of the Florida keys. Rept. 1850, app. 23,* pp. 106–110.

——— Florida coast reconnaissance. Rept. 1851, app. 31,* pp. 488–494.

LOUISIANA. Gerdes, F. H. Reconnaissance of the coast of Louisiana in 1854. Rept. 1854, app. 20,* pp. 28–30.

UNITED STATES COAST. General list of Coast survey discoveries and developments to 1854, inclusive. Rept. 1855, app. 9,* pp. 148–152.

Gerdes, F. H. On a reconnaissance from Suwanee river, Florida, to the mouths of the Mississippi. Rept. 1852, app. 12,* pp. 87–94.

McArthur, W. P. Report accompanying a reconnaissance chart of the western coast of the United States, from Monterey, Cal., to the Columbia river, Ore. Rept. 1850, app. 31,* pp. 119–121.

*See also* Coast Pilot—Physical hydrography.

---

* Exhausted.

**Hydrographic sheets.**

List of original topographic and hydrographic sheets, geographically arranged, registered in the archives of the United States Coast and geodetic survey from January, 1834, to December 31, 1895. Rept. 1895, pt. 2, app. 11, pp. 399–516.

**Hydrographic surveys** (Results—Discussion under Physical Hydrography).

General instructions in regard to the hydrographic work of the Coast survey. Instructions in methods of work. (1861 ?)

General instructions in regard to inshore hydrographic work of the Coast survey. Instructions in methods of work. (1878.)

General instructions for hydrographic work. Instructions in methods of work. (1883.)

General instructions for hydrographic parties, 1894. Instructions. (1894.)

Hydrography. (Leaflet printed for distribution at the Pan-American exposition, Buffalo, N. Y.) Sep. pub. (1901.)

Ackley, S. M. Hydrography. No. 8 in Bull. 29. (1893.)

ALASKA. Rodman, Hugh, (compiler), Alaska. General information relating to the vicinity of Chatham and Peril straits, from a recent survey of the U. S. Coast survey steamer Patterson, Lieut. Commander E. K. Moore, U. S. N., commanding, and Cooks inlet and the region the westward, by W. H. Dall. Bull. 35. (1897.)

ATLANTIC OCEAN. Mitchell, H. Physical hydrography of the Gulf of Maine. Rept. 1879, app. 10, pp. 175–190.

CALIFORNIA. Trinidad, Humboldt and San Diego bays. Rept. 1851, app. 50,* pp. 528–530.

Johnson, W. M. Features of Santa Cruz island, the valley of San Buenaventura, and the coast north of Santa Barbara channel. Rept. 1855, app. 28,* pp. 186–188.

CHESAPEAKE BAY. Winslow, Francis. Report on the oyster beds of the James river, Virginia, and of Tangier and Pocomoke sounds, Maryland and Virginia. Rept. 1881, app. 11, pp. 269–353.

DELAWARE BAY. Mitchell, H. Report on the delta of the Delaware. Rept. 1886, app. 10, pp. 267–269.

GEORGIA. Drake, J. C. On the sounds and estuaries of Georgia with reference to oyster culture. Bull. 19. (1891.)

MAINE. Report of Portland [Maine] harbor commission. Rept. 1855, app. 31,* pp. 200–219.

Mitchell, H. Physical survey of Portland harbor; velocities of tidal currents. Rept. 1873, app. 8,* pp. 94–102.

MASSACHUSETTS. Mitchell, H. Surveys in the Merrimack river, Massachusetts. Rept. 1867, app. 14,* pp. 170–175.

Marindin, H. L. Encroachment of the sea upon the coast of Cape Cod, Mass., as shown by comparative surveys. Rept. 1889, app. 12, pp. 403–407.

——— Cross sections of the shore of Cape Cod between Chatham and the Highland lighthouse. Rept. 1889, app. 13, pp. 409–457.

——— Changes in the shore line and anchorage areas of Cape Cod (or Provincetown) harbor, by comparison of surveys between 1835, 1867, and 1890. Rept. 1891, pt. 2, app. 8, pp. 283–288.

——— Cross sections of the shore of Cape Cod, Mass., between the Cape Cod and Long point light-houses. Rept. 1891, pt. 2, app. 9, pp. 289–341.

——— Changes in the shore lines and anchorage areas of Cape Cod (or Provincetown) harbor, as shown by a comparison of surveys made between 1867 and 1890. Bull. 24. (1891.)

——— Changes in the ocean shore lines of Nantucket island, Mass., from a comparison of surveys 1846 to 1887 and in 1891. Rept. 1892, pt. 2, app. 6, pp. 243–252.

——— Cross sections on the north shores of Nantucket and Martha's Vineyard, Mass. Rept. 1896, pt. 2, app. 9, pp. 347–352.

——— Tables of cross sections on the north shores of Nantucket and Martha's Vineyard, Mass. Rept. 1896, pt. 2, app. 8,* pp. 305–346.

Whiting, H. L. Provincetown harbor, Massachusetts; special survey. Rept. 1867, app. 12,* pp. 149–157.

——— Report of changes in the shore line and beaches of Martha's Vineyard, as derived from comparisons of recent with former surveys. Rept. 1886, app. 9, pp. 263–266.

——— (And Mitchell, H.) Reports concerning Martha's Vineyard and Nantucket. Rept. 1869, app. 15,* pp. 236–259.

MISSISSIPPI RIVER. Mitchell, H. Recent observations at South pass bar, Mississippi river. Rept. 1875, app. 11,* pp. 189–193.

——— Characteristics of South pass, Mississippi river. Rept. 1876, app. 12, pp. 190, 191.

NEW JERSEY. Mitchell, Henry. Changes in the submerged contours off Sandy Hook. Rept. 1873, app. 10,* pp. 108–110.

Whiting, H. L. Progress of Sandy Hook from 1848 to 1850. Rept. 1850, app. 9,* pp. 81, 82.

NEW YORK. Resurvey of New York bay and harbor and dependencies for the Commissioners on harbor encroachments. Rept. 1855, app. 24,* pp. 165–171.

Bartlett, W. A. On Pot rock, Hell Gate. Rept. 1852, app. 8,* p. 84.

Boschke, A. [Comparative] maps, New York harbor. Rept. 1856, app. 48,* pp. 281, 282.

——— Report on the drawing of maps of New York harbor, made for the Commissioners on harbor encroachments. Rept. 1857, app. 38,* pp. 373, 374.

Mitchell, H. Physical survey of New York harbor and the coast of Long Island, with descriptions of apparatus for observing currents. Rept. 1859, app. 26,* pp. 311–317.

——— Harbor of New York, 1873. Rept. 1871, app. 8,* pp. 109–133.

---

* Exhausted. † Not for general distribution.

NEW YORK. Mitchell, H. Middle-ground shoal, New York harbor. Rept. 1872, app. 16,* pp. 257–261.

——— Physical survey of New York harbor. Rept. 1876, app. 10,* pp. 147–185.

——— Location of a quay or pier line in the vicinity of the United States Navy-yard at New York. Rept. 1876, app. 11, pp. 186–189.

——— Report on the results of the physical survey of New York harbor. Rept. 1887. app. 15, pp. 301–311.

Pendleton, A. G. Report to Commissioners on preservation of New York harbor from encroachment, by the advisory council on the comparative map of New York bay and harbor and approaches; prepared by the Coast survey. Rept. 1857, app. 37,* pp. 358–373.

Temple, W. G. Results of examination to determine least water on the rocks at Hell Gate, East river, New York. Rept. 1857, app. 13,* pp. 150, 151.

NORTH CAROLINA. Bradford, J. S. Entrance to Cape Fear river. Hydrographic changes. Rept. 1865, app. 5,* p. 45.

Huger, T. B. Comparison of hydrographic surveys in 1856 and 1858, at the entrance of Cape Fear river. Rept. 1858, app. 13,* pp. 150–151.

Maffit, J. N. Beaufort harbor. Rept. 1854, app. 14,* pp. 21–23.

——— Re-examination of the bars and estuaries to Cape Fear river. Rept. 1857, app. 17,* pp. 153–156.

Rodgers, C. R. P. Results of a re-survey of bar and anchorage, Beaufort harbor. Rept. 1857, app. 16,* pp. 152–153.

Whiting, H. L. Beaufort harbor. Rept. 1851, app. 28,* pp. 482–484.

Winslow, Francis. Report on the sounds and estuaries of North Carolina with reference to oyster culture. Bull. 10. (1889.)

PENNSYLVANIA. Marindin, H. L. Comparison of the surveys of Delaware river front of Philadelphia, 1843 and 1878. Rept. 1880, app. 9, pp. 110–125.

Mitchell, H. Physical survey of the Delaware river at Philadelphia. Rept. 1878, app. 9, pp. 121–173.

*See also* Coast pilot—Currents—Oceanography—Physical hydrography—Sounding—Tides.

**Hydrography.** *See* Currents—Charts—Drawing—Hydraulic engineering—Hydrographic surveys—Marine engineering—Oceanography—Physical hydrography—Sounding—Tides—Topography.

**Hydrometer.**

Hilgard, J. E. Ocean salinometer. Rept. 1874, app. 16,* pp. 154, 155.

——— Optical densimeter for ocean water. Rept. 1877, app. 10, pp. 108–113.

Tittmann, O. H. Reduction of hydrometer observations of salt water densities. Ed. 1. Bull. 18. (1890.)

——— Same. Rept. 1891, pt. 2, app. 6, pp. 275–277.

*See also* Sea water densities.

**Hypsometry.**

Braid, Andrew. Hypsometry. No. 10 in Bull. 29. (1893.)

Schott, C. A. Observations of atmospheric refraction. Contribution no. II. Determination of several heights by the spirit level, and measures of refraction by zenith distances, also observations of the barometer at Ragged mountain, Maine, by F. W. Perkins. Rept. 1876, app. 17, pp. 355–367.

——— Atmospheric refraction and adjustment of hypsometric measures. Contribution no. III. Determination of the coefficient of refraction from zenith distances observed in northern Georgia, by Assistants C. O. Boutelle and F. P. Webber, in 1873 and 1874, and adjustment of difference of heights by the method of least squares. Rept. 1876, app. 18, pp. 368–387.

——— Hypsometric formulæ, based upon thermodynamic principles. Rept. 1876, app. 19, pp. 388–390.

*See also* Barometric hypsometry—Elevations—Leveling—Micrometric measures—Refraction—Tables—Vertical measures.

**Icebergs.**

Alexander, Stephen. Expedition to Labrador, to observe the total eclipse of the 18th of July, 1860. Report on the determination of the magnetic elements by Edward Goodfellow, assistant, with notes by C. A. Schott, assistant. Rept. 1860, app. 21,* pp. 229–275.

**Iced bar apparatus.** *See* Base measuring apparatus.

**Iconometry.** *See* Phototopography.

**Illinois.**

Schott, C. A. Results of spirit leveling of precision between Odin, Ill., and Okolona, Miss. Rept. 1892, pt. 2, app. 3, pp. 161–203.

*See also* Chicago—Transcontinental arc.

**Inclination, Magnetic.** *See* Magnetic inclination.

**Incrustation.** *See* Boilers.

**Indexes.** *See* Bibliography.

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*Exhausted.

**Indian territory.**

Baldwin, A. L. On the measurement of nine bases along the ninety-eighth meridian. Rept. 1901, app. 3, pp. 229-302.

**Indiana.** *See* Holton base.

**Indicator.** *See* Tide indicator.

**Induction time.**

Dean, G. W. Report on preliminary experiments made to determine the variations of "induction time" in relay magnets. Rept. 1863, app. 23,* p. 205.

**Instructions.**

Thorn, F. M. Instructions and memoranda for descriptive reports to accompany original sheets. Rept. 1887, app. 11,* pp. 211-215.

*See also* List of Instructions in methods of work and Laws and regulations (under list of Administrative publications) in Part I.

**Instruments.**

Hilgard, J. E. On the action of sea-water on metals used in the construction of instruments and on magnetic needles. Rept. 1854, app. 55,* pp. 192, 193.

Saegmuller, G. N. Reconstruction of the [graduating or] dividing engine of the Coast and geodetic survey. Rept. 1879, app. 12,* pp. 192-198.

Smith, Edwin. Notes on some instruments recently made in the instrument division of the Coast and geodetic survey office. Rept. 1894, pt. 2, app. 8, pp. 263-275.

*See also* Artificial horizon—Base measuring apparatus—Chronograph—Current float—Current meter—Depth recorder—Dip instrument—Dividers—Dredging apparatus—Electro-magnetism—Graduating apparatus—Heliotrope—Hydrometer—Interranger—Leveling—Leveling rods—Log—Longitude—Longitude instruments—Magnetic instruments—Magnetic needle—Magnetometer—Meridian instrument—Micrometric measures—Pantograph—Pendulum—Personal equation apparatus—Phototopography—Plane table—Sounding apparatus—Standards—Telegraph—Telescopes—Theodolite—Thermometer—Tide indicator—Tide gauge—Tide predicting machine—Transit (instrument)—Weights and measures office—Zenith telescope.

**Intensity, Magnetic.** *See* Magnetic intensity.

**International geodetic association.**

Davidson, George. Ninth conference of the International geodetic association held at Paris, October, 1889. Rept. 1889, app. 18, pp. 493-503.

——— Address at International geodetic association. Ninth conference. Paris, October 3-12, 1889. Rept. 1890, app. 17, pp. 721-733.

Mendenhall, T. C. On the variation of latitude at Rockville, Md., as determined from observations made in 1891 and 1892, in cooperation with the International geodetic association. Prefatory note. Rept. 1892, pt. 2, app. 1, pp. 1, 2.

——— Same, abstract. Bull. 25. (1892.)

Preston, E. D. Observations for the variation of latitude, made near Honolulu, Oahu, Hawaiian islands, in cooperation with the work of the International geodetic association and on the determination of gravity and the magnetic elements. Rept. 1891, pt. 2, app. 13, pp. 479-485.

——— Variation of latitude at Waikiki, near Honolulu, Hawaiian islands, as determined from observations made in 1891 and 1892 in cooperation with the International geodetic association. Rept. 1892, pt. 2, app. 2, pp. 53-159.

——— Report on the proceedings of the International geodetic association conference at Stuttgart, Germany, October 3d to 12th, 1898, and on geodetic operations in the United States. Rept. 1898, app. 6, pp. 243-260.

——— The International geodetic association for the measurement of the earth. Rept. 1899, app. 3, pp. 241-269.

Schott, C. A. Variation of latitude at Rockville, Md., as determined from observations made in 1891 and 1892, in co-operation with the International geodetic association. Reductions of the observations and discussion of the results. Rept. 1892, pt. 2, app. 1, pp. 17-51.

——— Same, abstract. Bull. 25. (1892.)

——— Variation of latitude at San Francisco, Cal., from observations made in concert with the International geodetic association, 1891 and 1892. Rept. 1893, pt. 2, app. 11, pp. 441-508.

Smith, Edwin. Variation of latitude at Rockville, Md., as determined from observations made in 1891 and 1892, in co-operation with the International geodetic association. Description of the station, instruments, and methods of observing. Rept. 1892, pt. 2, app. 1, pp. 2-17.

——— Same, abstract. Bull. 25. (1892.)

——— (And Schlesinger, F.) The International latitude service at Gaithersburg, Md., and Ukiah, Cal., under the auspices of the International geodetic association. Rept. 1900, app. 5, pp. 495-520.

**International latitude service.** *See* International geodetic association.

**Interpolation.**

Schott, C. A. Cauchy's interpolation formulæ, with remarks by C. A. Schott. Rept. 1860, app. 37,* pp. 392-396.

---

* Exhausted.

**Interranger.**
Aligning reflector or interranger, Hunt's. Rept. 1853, app. 37,* pp, 93, 94.

**Intervisibility.**
Hilgard, J. E. Intervisibility of stations. Rept. 1873, app. 13,* p. 137.

**Isoclinic lines.** *See* Magnetic inclination.

**Isodynamic lines.** *See* Magnetic intensity.

**Isogonic charts.**
Bauer, L. A. United States magnetic declination tables and isogonic charts for 1902 and principal facts relating to the earth's magnetism. Sep. pub. (1902.)

**Isogonic lines.** *See* Magnetic declination.

**Isthmian canals.** *See also* Darien—Nicaragua—Panama.

**Italy.**
Flemer, J. A. Phototopography as practiced in Italy under the auspices of the Royal military geographical institute, and as practiced in the Dominion of Canada under the auspices of the Department of the interior. Also a short historical review of other photographic surveys and publications on the subject. Rept. 1893, pt. 2, app. 3, pp. 37–116.

**Jacobsen, Oscar.**
On the air contained in sea water. Sep. pub. (1874.)*

**Jäderin, Edward.**
On the measurement of base lines with steel tapes and with steel and brass wires. Translated by J. H. Gore. Rept. 1893, pt. 2, app. 5, pp. 125–164.

**James river, Va.**
Winslow, Francis. Report on the oyster beds of the James river, Virginia, and of Tangier and Pocomoke sounds, Maryland and Virginia. Rept. 1881, app. 11, pp. 269–353.

**Japan.** *See* Nagasaki—Tokio.

**Japan current.** *See* Kuro Siwo.

**Jarvis, David Henry.**
Alaska. Coast pilot notes on the Fox islands passes, Unalaska bay, Bering sea, and Arctic ocean as far as Point Barrow. Bull. 40. (1900.)

**Jefferson City, Mo.—Levels—Holliday, Kans.**
Schott, C. A. Resulting heights from spirit leveling between Jefferson City, Mo., and Holliday, Kans., 1891. Rept. 1896, pt. 2, app. 5, pp. 265–284.

**Jefferson City, Mo.—Levels—St. Louis, Mo.**
Schott, C. A. Heights from geodetic leveling between St. Louis and Jefferson City, Mo., 1882–1888. Rept. 1893, pt. 2, app. 2, pp. 19–36.

**Jersey flats.** *See* New York harbor.

**Joe Flogger shoal.**
Mitchell, Henry. A report on the delta of the Delaware. Rept. 1886, app. 10, pp. 267–279.

**Johnson, William M.**
Features of Santa Cruz island, the valley of San Buenaventura, and the coast north of Santa Barbara channel. Rept. 1855, app. 28,* pp. 186–188.
Topographical features of the coast adjacent to Santa Barbara channel. Rept. 1857, app. 43,* pp. 390, 391.

**Kadiak, Alas.**
Moser, J. F. Hydrographic notes and sailing directions, and charts of surveys relating to the vicinity of Prince William sound, Cooks inlet, Kadiak island, and route from Unalaska to Chignik, through Unimak pass and inside the islands. Bull. 38. (1899.)
Schott, C. A. Resulting longitudes of Kadiak, Unalaska, and Unga, Alaska, as determined chronometrically from Sitka in 1896, by the party under the charge of Fremont Morse, assistant. Rept. 1897, pt. 2, app. 3, pp. 263–268.

**Kamchatka, Siberia.**
Schott, C. A. The magnetic observations made on Bering's first voyage to the coasts of Kamchatka and eastern Asia in the years 1725 to 1730. Bull. 20. (1891.)
——— Same. Rept. 1891, p. 2, app. 5, pp. 269–273.

**Kansas.**
BASE MEASURES. Baldwin, A. L. On the measurement of nine base lines along the ninety-eighth meridian. Rept. 1901, app. 3, pp. 229–302.
LEVELING. Schott, C. A. Resulting heights from spirit leveling between Jefferson City, Mo., and Holliday, Kans., 1891. Rept. 1896, pt. 2, app. 5, p. 265–284.

---

*Exhausted.

LEVELING. Resulting heights from spirit leveling between Holliday and Salina, Kans. From observations by I. Winston, assistant, between July 11 and October 28, 1895. Rept. 1897, pt. 2, app. 4, pp. 269–283.

——— Resulting heights from spirit leveling between Salina and Ellis, Kans., from observations made by I. Winston, assistant, between July 2 and September 9, 1896. Rept. 1898, app. 1, pp. 179–193.

——— Resulting heights from spirit leveling between Ellis, Kans., and Hugo, Colo., from observations by I. Winston, assistant, between June 11 and November 17, 1897. Rept. 1898, app. 2, pp. 195–214.

Tilton, B. E. Resulting elevations from spirit leveling between Abilene, Kans., and Norfolk, Nebr., 1899. Rept. 1899, app. 6, pp. 299–320.

TRIANGULATION. Hayford, J. F. Triangulation northward along the ninety-eighth meridian in Kansas and Nebraska. Rept. 1901, app. 6, p. 357–423.

*See also* Transcontinental arc.

**Katama bay, Mass.**

Marindin, H. L. Tides and currents in the harbor of Edgartown and in Katama bay, Martha's Vineyard. Rept. 1892, pt. 2, app. 5, pp. 225–241.

**Kellogg, Albert.**

Botany of Alaska territory. Rept. 1867, app. 18 L, M,* pp. 318–324.

**Kenai language.**

Vocabularies of the Kodiac, Unalashka, Kenai and Sitka languages. Rept. 1867, app. 18 G,* pp. 293–298.

**Kendall, E. Otis.**

Moon culminations observed at High school observatory, Philadelphia. Rept. 1854, app. 38,* p. 120.

**Kent island base, Md.**

Schott, C. A. Length of the Kent island base line. Rept. 1866, app. 8 (supplement), p. 140.

**Kentucky.**

Geographical positions determined approximately in West Virginia, Kentucky, Tennessee, Alabama, Mississippi, and Missouri. Rept. 1865, app. 10,* p. 137.

Schott, C. A. Results of spirit leveling of precision between Okolona, Miss., and Odin, Ill. Rept. 1892, pt. 2, app. 3, pp. 161–203.

*See also* Louisville—Mississippi river.

**Key Biscayne base, Fla.**

Schott, C. A. Report on the resulting length and probable uncertainty of five principal base lines, measured with the Bache-Würdemann compensation base apparatus between 1847 and 1855. Rept. 1889, app. 17, pp. 479–491.

**Key West, Fla.**

Bache, A. D. On the tides at Key West, Florida. Rept. 1853, app. 27,* pp. 71–76.

Schott, C. A. Observations of terrestrial magnetism at Key West, Fla., made between 1860 and 1866. Rept. 1874, app. 9,* pp. 109–130.

Schott, C. A. Telegraphic longitude of Key West. Rept. 1875, app. 9,* pp. 139–156.

Trowbridge, W. P. Report on the magnetic station at Key West, Florida reef. Rept. 1860, app. 26,* pp. 326–349.

*See also* Gulf stream.

**Keyport, N. J.—Levels—Gloucester, N. J.**

Cutts, R. D. Leveling operations between Keyport, on Raritan bay and Gloucester, on the Delaware river, to determine the heights above mean tide of the primary stations Beacon hill, Disboro, Stony hill, Mount Holly, and Pine hill. Rept. 1870, app. 7,* pp. 75, 76.

——— Leveling operations between Keyport, on Raritan bay, and Gloucester, on the Delaware river, to determine the height above mean tide of the primary stations Beacon hill, Disboro, Stony hill, Mount Holly, and Pine hill. Rept. 1871, app. 12,* pp. 171–175.

**Keys.** *See* Florida keys.

**Kill Von Kull.** *See* New York harbor.

**Kilogram.**

Tittmann, O. H. Historical account of United States standards of weights and measures; of the national prototypes of the metre and the kilogramme; of their transportation from Paris to Washington; of their official opening and certification, and of their deposit in the office of weights and measures. Rept. 1890, app. 18, pp. 735–758.

**Kodiak language.**

Vocabularies of the Kodiak, Unalashka, Kenai and Sitka languages. Rept. 1867, app. 18 G,* pp. 293–298.

---

* Exhausted.

**Kohl, John George.**
Abstract of a complete historical account of the progress of discovery on the western coast of the United States from the earliest period. Rept. 1855, app. 64,* pp. 374, 375.
Abstract of an historical memoir concerning the progress of exploration on the Atlantic coast of the United States. Rept. 1856, app. 65,* pp. 319–322.
Abstract of an historical account of explorations made on the coast of the Gulf of Mexico (within the limits of the United States). Rept. 1856, app. 66,* pp. 322–324.
Western coast annals of maritime discovery and exploration. Report of the method and scope of a memoir on. Rept. 1857, app. 52,* pp. 414–433.
History of discovery and exploration on the coasts of the United States. Rept. 1884, app. 19,* pp. 495–617.

**Koos bay.** *See* Coos bay.

**Kummell, Charles H.**
On an approximate method of deducing probable error. Rept. 1890, app. 13, pp. 685–687.
On the direct synthetical method of adjusting a triangulation. Rept. 1892, pt. 2, app. 12, pp. 535–552.
A new solution of the geodetic problem. Rept. 1896, pt. 2, app. 7, pp. 293–303.

**Kuro Siwo.**
Dall, W. H. Report on the currents and temperatures of Bering sea and adjacent waters. Rept. 1880, app. 16,* pp. 297–340.

**L. M. Z.** *See* Tables.

**La Caille's observations.**
Powalky, C. R. New reduction of La Caille's observations, made at the Cape of Good Hope between 1749 and 1757, and given in his "Astronomiæ Fundamenta," together with a comparison of the results with the "Bradley-Bessel Fundamenta;" also, a catalogue of the places of 150 stars south of declination 30°, for the epochs 1750 and 1830. Rept. 1882, app. 21, pp. 469–502.

**Labrador.**
Alexander, Stephen. Expedition to [Aulezavik island] Labrador, to observe the total eclipse of the 18th of July, 1860. Rept. 1860, app. 21,* pp. 229–275.
Lieber, O. M. Geology of the coast of Labrador. Rept. 1860, app. 42,* pp. 402–408.
Murray, A. Labrador eclipse expedition and incidental results bearing on the hydrography of the coast of Labrador. Rept. 1860, app. 41,* pp. 399–402.

**Lake Champlain.**
Schott, C. A. Fluctuations in the level of Lake Champlain and average height of its surface above the sea. Rept. 1887, app. 7, pp. 165–172.

**Lake levels.** *See* Water level.

**Lake Ontario.**
Schott, C. A. Connection at Lake Ontario of the primary triangulation of the Coast and geodetic survey with that of the Lake survey. Rept. 1884, app. 9, pp. 387–390.
*See also* Lake Champlain.

**Lake survey.**
Schott, C. A., and Tittmann, O. H. The relation between the metric standards of length of the U. S. Coast and geodetic survey and the U. S. Lake survey. Bull. 17. (1889.)
——— Same, with additions. Rept. 1889, app. 6,* pp. 179–197.

**Lampasas base, Tex.**
Baldwin, A. L. On the measurement of nine base lines along the ninety-eighth meridian. Rept. 1901, app. 3, pp. 229–302.

**Land surveys.**
Report to the Commissioner of the general land office showing progress made in the survey and marking (in quarter sections) of the Florida keys. Rept. 1856, app. 52,* pp. 286, 289.
Letter from the Superintendent coast survey, to the Commissioner of the general land office, communicating the results of the survey of Florida keys, in the vicinity of Key West and Spanish harbor. Rept. 1854, app. 19,* pp. 25–27.
Report to Commissioner of general land office on progress made in survey and marking of the Florida keys in quarter sections. Rept. 1857, app. 42,* pp. 382–390.
Superintendent's report to Commissioner of general land office on progress made in surveying and marking of the keys—continued. Rept. 1858, app. 35,* pp. 225–227.

**Lane, Jonathan Homer.**
New form of mercurial horizon. Rept. 1871, app. 16,* pp. 189–192.

**Languages.**
Vocabularies of the Kodiac, Unalashka, Kenai, and Sitka languages. Rept. 1867, app. 18 G,* pp. 293–298.
Vocabulary, Alaskan. Rept. 1867, app. 18 N,* pp. 325–329.

---

*Exhausted.

**Latitude.**

Formulæ, tables and example for computing geodetic latitudes, longitudes, and azimuths. Rept. 1860, app. 36,* pp. 361–391.

Same. Ed. 2, much enlarged. Title changed to Formulæ and factors for the computation of geodetic latitudes, longitudes and azimuths. Rept. 1875, app. 19,* pp. 315–368.

Same. Ed. 3. Title like ed. 2. Rept. 1884, app. 7,* pp. 323–375.

Same. Ed. 4. Title changed to Formulæ and tables for the computation of geodetic positions. Rept. 1894, pt. 2, app. 9, pp. 277–348.

List of stars for observations of latitude. Rept. 1873, app. 14, pp. 138–174.

Time, latitude and longitude. (Leaflet printed for distribution at the Pan-American exposition Buffalo, N. Y.) Sep. pub. (1901).

Bache, A. D. On a supposed personal equation in the use of the zenith telescope for determining latitude by Talcott's method. Rept. 1858, app. 20,* pp. 184–186.

Hayford, J. F. Determination of time, longitude, latitude and azimuth. Rept. 1898, app. 7, pp. 261–409.

Preston, E. D. Differential method of computing the apparent places of stars for determinations of latitude. Rept. 1888, app. 13, pp. 465–470.

Schott, C. A. On the method for determination of latitude by the zenith telescope. Rept. 1857, app. 31,* pp. 324–334.

——— Latitude by the zenith telescope. Rept. 1866, app. 10,* pp. 72–85.

——— Determination of latitude by means of the zenith telescope. Rept. 1880, app. 14,* pt. 3, pp. 243–259.

Sinclair, C. H. Time, latitude and longitude. No. 4 in Bull. 29. (1893.)

ALASKA. Reid, H. F. Report of an expedition to Muir glacier, Alaska, with determinations of latitude and the magnetic elements at Camp Muir, Glacier bay. Rept. 1891, pt. 2, app. 14, pp. 487–501.

Schott, C. A. Abstract of resulting latitudes of some prominent stations in Alaska and adjacent parts as astronomically determined during 1889–1895. Rept. 1895, pt. 2, app. 2, pp. 321–332.

CALIFORNIA. Davidson, G. Astronomical observations on the Sierra Nevada. Rept. 1872, app. 9,* pp. 173–176.

CHATHAM ISLAND. Smith, Edwin. Transit of Venus, Chatham island, 1874. Rept. 1875, app. 14, pp. 231–248.

HAWAII. Preston, E. D. Determinations of latitude and gravity for the Hawaiian government. Rept. 1888, app. 14, pp. 471–563.

——— Same, abstract. Bull. 11. (1889.)

——— Determinations of latitude, gravity, and magnetic elements at stations in the Hawaiian islands, including a result for the mean density of the earth, 1891, 1892. Rept. 1893, pt. 2, app. 12, pp. 509–638.

MASSACHUSETTS. Gould, B. A. Report on the latitude of Cloverden station, in Cambridge. Rept. 1865, app. 17,* pp. 160–165.

WASHINGTON. Gilliss, J. M. Solar eclipse of July, 1860, observed near Fort Steilacoom, W. T. Rept. 1860, app. 22,* pp. 275–292.

WYOMING. Cutts, R. D., and Young, C. A. Astronomical and meteorological observations made at Sherman, Wyo. T. Rept. 1872, app. 8,* pp. 75–172.

*See also* Aberration—Geographic positions—Latitude variation—Meridian instrument—Micrometric measures—Plumb line deflection—Star catalogues—Zenith telescope.

**Latitude variation.**

Smith, Edwin, and Schlesinger, F. The International latitude service at Gaithersburg, Md., and Ukiah, Cal., under the auspices of the International geodetic association. Rept. 1900, app. 5, pp. 495–520.

CALIFORNIA. Preston, E. D. Determination of the constant of aberration from latitude observations with the zenith telescope at Honolulu, H. I., and San Francisco, Cal. Rept. 1896, app. 10, pp. 353–371.

——— The constant of aberration as determined from observations of latitude at San Francisco, California. Bull. 32. (1895.)

Schott, C. A. Variation of latitude at San Francisco, Cal., from observations made in concert with the International geodetic association, 1891 and 1892. Rept. 1893, pt. 2, app. 11, pp. 441–508.

HAWAII. Preston, E. D. Observations for the variation of latitude, made near Honolulu, Oahu, Hawaiian islands, in cooperation with the work of the International geodetic association and on the determination of gravity and the magnetic elements. Rept. 1891, pt. 2, app. 13,* pp. 479–485.

——— Variation of latitude at Waikiki, near Honolulu, Hawaiian islands, as determined from observations made in 1891 and 1892 in cooperation with the International geodetic association. Rept. 1892, pt. 2, app. 2, pp. 53–159.

——— Results of observations for the variations of latitude at Waikiki, Hawaiian islands, in cooperation with the work of the International geodetic association. Bull. 27. (1893.)

——— The constant of aberration as determined from a discussion of results for latitude at Waikiki, Hawaiian islands. Bull. 28. (1893.)

——— Determination of the constant of aberration from latitude observations with the zenith telescope at Honolulu, H. I., and San Francisco, Cal. Rept. 1896, app. 10, pp. 353–371.

MARYLAND. Mendenhall, T. C. Prefatory note. Variations of latitude at Rockville, Md., as determined from observations made in 1891 and 1892, in co-operation with the International geodetic association. Rept. 1892, pt. 2, app. 1, pp. 1, 2.

---

* Exhausted.

MARYLAND. Same, abstract. Bull. 25. (1892.)

Schott, C. A. Variation of latitude at Rockville, Md., as determined from observations made in 1891 and 1892, in co-operation with the International geodetic association. Reductions of the observations and discussions of the results. Rept. 1892, pt. 2, app. 1, pp. 17–51.

——— Same, abstract. Bull. 25. (1892.)

Smith, Edwin. Variation of latitude at Rockville, Md., as determined from observations made in 1891 and 1892 in co-operation with the International geodetic association. Rept. 1892, pt. 2, app. 1, pp. 2–17.

——— Same, abstract. Bull. 25. (1892.)

*See also* Micrometric measures—Stars (Polar).

**Laws.**

Fairfield, G. A. State laws authorizing entrance upon lands within state limits for the purposes of the Coast and geodetic survey. Rept. 1893, pt. 2, app. 1, pp. 1–18.

*See also* Standards.

**Laws and regulations.** *See* List of Laws and regulations and of Instructions in methods of work (under Administrative publications) in Part I.

**Lawson, James S.**

General character of Koos bay, Oregon. Rept. 1861, app. 30,* pp. 264, 265.

Transit of Venus of December 6, 1882, at Tepusquet station, California. Rept. 1883, app. 16, pp. 375, 376.

**Least square method.**

Bache, A. D. Comparison of the reduction of horizontal angles by the methods of "dependent directions" and of "dependent angular quantities" by the method of least squares. Rept. 1854, app. 33,* pp. 63–70.

Kummell, C. H. On an approximate method of deducing probable error. Rept. 1890, app. 13, pp. 685–687.

Merriman, Mansfield. On the determination by least squares of the relation between two variables liable to errors of observation. Rept. 1890, app. 13, pp. 687–690.

Peirce, C. S. On the theory of errors of observation. Rept. 1870, app. 21,* pp. 200–224.

Schott, C. A. Determination of the probable error of an observation by the differences of the observations from their arithmetical mean. Rept. 1856, app. 59,* pp. 307, 308.

*See also* Adjustment.

**Least water.** *See* Channels—Depths.

**Lee, S. Phillips**

Table showing temperatures at depths below 700 fathoms taken by Lieutenants Commanding C. H. Davis in 1845, George M. Bache in 1846, and S. P. Lee in 1847. Rept. 1847, app. 11,* p. 75.

**Lehman's ranch, Nev.**

Eimbeck, William. Transit of Venus of December 6, 1882, at Lehman's ranch, Nevada. Rept. 1883, app. 16, pp. 376–378.

**Length.** *See* Meter—Mile—Standards—Yard.

**Lenses.**

Hilgard, J. E. On the trial of Harrison's globe lens previous to its use in the photograph division. Rept. 1863, app. 24,* pp. 206, 207.

**Lettering.**

Welch, Williams. Proportions and spacing of Roman letters as ascertained from the best examples. Rept. 1900, app. 4, pp. 485–494.

**Levees.**

Mitchell, H. Reclamation of tide lands and its relation to navigation. Rept. 1869, app. 5, pp. 75–104.

**Leveling.**

Leveling. (Leaflet printed for distribution at the Pan-American exposition, Buffalo, N. Y.) Sep. pub. (1901.)

Cutts, R. D. Memoranda relating to the field work of the secondary triangulation. Rept. 1868, app. 7,* pp. 109–139.

Tittmann, O. H. Instruments and methods used in the Coast and geodetic survey for precise leveling. Rept. 1879, app 15, pp. 202–211.

ALABAMA. Schott, C. A. Height from spirit levelings of precision between Mobile, Ala., and Carrolton (New Orleans), La. Rept. 1887, app. 9, pp. 185–205.

——— Heights from spirit leveling of precision between Mobile, Ala., and Okolona, Miss. Rept. 1888, app. 10, pp. 409–426.

ARKANSAS. Schott, C. A. Heights from spirit leveling of precision between New Orleans, La., and Arkansas City, Ark. Rept. 1888, app. 11, pp. 427–453.

---

* Exhausted.

ARKANSAS. Heights from spirit leveling of precision between Arkansas City (on the Mississippi river) and Little Rock, Ark. Rept. 1888, app. 12, pp. 455-464.

CALIFORNIA. Davidson, G., and Schott, C. A. Comparison of the methods of determining heights by means of leveling, vertical angles, and barometric measures, from observations at Bodega Head and Ross mountain, California. Rept. 1871, app. 11,* pp. 154-170.

——— Same. Rept. 1876, app. 16, pp. 338-354.

COLORADO. Schott, C. A. Resulting heights from spirit leveling between Hugo and Colorado Springs, Colo. Rept. 1898, app. 3, pp. 215-228.

——— Resulting heights from spirit leveling between Ellis, Kans., and Hugo, Col. Rept. 1898, app. 2, pp. 195-214.

Winston, Isaac. Resulting elevations from spirit leveling between Denver, Col., and Rock Creek, Wyo., from observations between May 12 and October 21, 1899. Rept. 1899, app. 5, pp. 283-298.

DISTRICT OF COLUMBIA. Schott, C. A. Resulting heights from spirit leveling between Washington, D. C., and Hagerstown, Md., 1883. Rept. 1896, pt. 2, app. 4, pp. 261-264.

——— Result of spirit leveling between tide water at Annapolis, Md., and the Capitol bench mark at Washington, D. C. Rept. 1889, app. 15, pp. 461-466.

ILLINOIS. Schott, C. A. Results of spirit leveling between Okolona, Miss., and Odin, Ill. Rept. 1892, pt. 2, app. 3, pp. 161-203.

KANSAS. Schott, C. A. Resulting heights from spirit leveling between Jefferson City, Mo., and Holliday, Kans. Rept. 1896, pt. 2, app. 5, pp. 265-284.

——— Resulting heights between Holliday and Salina, Kans., in 1895. Rept. 1897, pt. 2, app. 4, pp. 269-283.

——— Resulting heights from spirit leveling between Salina and Ellis, Kans., in 1896. Rept. 1898, app. 1, pp. 179-193.

——— Resulting heights from spirit leveling between Ellis, Kans., and Hugo, Col., in 1897. Rept. 1898, app. 2, pp. 195-214.

Tilton, B. E. Resulting elevations from spirit leveling between Abilene, Kans., and Norfolk, Neb., in 1899. Rept. 1899, app. 6, pp. 299-320.

KENTUCKY. Schott, C. A. Resulting heights of spirit leveling of precision between Okolona, Miss., and Odin, Ill. Rept. 1892, pt. 2, app. 3, pp. 161-203.

LOUISIANA. Schott, C. A. Heights from spirit levelings of precision between Mobile, Ala., and Carrollton (New Orleans), La. Rept. 1887, app. 9, pp. 185-205.

——— Heights from spirit leveling of precision between New Orleans, La., and Arkansas City, Ark. Rept. 1888, app. 11, pp. 427-453.

MAINE. Schott, C. A. Observations of atmospheric refraction—contribution No. II. Determination of several heights by the spirit level, and measures of refraction by zenith distances; also observations of the barometer at Ragged mountain, Maine, by F. W. Perkins. Rept. 1876, app. 17, pp. 355-367.

MARYLAND. Schott, C. A. Result of spirit leveling between tide water at Annapolis, Md., and the Capitol bench mark at Washington, D. C. Rept. 1889, app. 15, pp. 461-466.

——— Resulting heights from spirit leveling between Hagerstown, Md., and Washington, D. C., 1883. Rept. 1896, pt. 2, app. 4, pp. 261-264.

MICHIGAN. Ferguson, O. W. Resulting elevations from spirit leveling between Gibraltar, Mich., and Cincinnati, Ohio, in 1899. Rept. 1899, app. 7, pp. 321-345.

MISSISSIPPI. Schott, C. A. Heights from spirit levelings of precision between Mobile, Ala., and Carrollton (New Orleans), La. Rept. 1887, app. 9, pp. 185-205.

——— Heights from spirit leveling of precision between Mobile, Ala., and Okolona, Miss. Rept. 1888, app. 10, pp. 409-426.

——— Results of spirit leveling of precision between Okolona, Miss., and Odin, Ill. Rept. 1892, pt. 2, app. 3, pp. 161-203.

——— On the results of spirit leveling of precision between Corinth, Miss., and Memphis, Tenn. Rept. 1892, pt. 2, app. 4, pp. 205-224.

MISSISSIPPI RIVER. Braid, Andrew. Geodetic leveling on the Mississippi river. Rept. 1880, app. 11, pp. 135-144.

MISSOURI. Schott, C. A. Heights from geodetic leveling between St. Louis and Jefferson City, Mo., 1882-1888. Rept. 1893, pt. 2, app. 2, pp. 19-36.

——— Resulting heights from spirit leveling between Jefferson City, Mo., and Holliday, Kans., 1901. Rept. 1896, pt. 2, app. 5, pp. 265-284.

NEBRASKA. Tilton, B. E. Resulting elevations from spirit leveling between Abilene, Kans., and Norfolk, Neb., in 1899. Rept. 1899, app. 6, pp. 299-320.

NEW JERSEY. Cutts, R. D. Leveling operations between Keyport, on Raritan bay, and Gloucester, on the Delaware river, to determine the heights above mean tide of the primary stations Beacon hill, Disboro, Stony hill, Mount Holly, and Pine hill. Rept. 1870, app. 7,* pp. 75-76.

——— Same, revised. Rept. 1871, app. 12,* pp. 171-175.

Schott, C. A. Report of the results of spirit leveling of precision about New York bay and vicinity in 1886 and 1887. Rept. 1887, app. 14, pp. 275-300.

NEW YORK. Mitchell, H. Tides and currents in Nantucket and in Martha's Vineyard sounds and in East river at Hell Gate, with remarks on the revision of levelings on Hudson river. Rept. 1857, app. 35,* pp. 350-354.

——— Currents in the East river at Hell Gate and Throg's Neck, the sub-currents of New York bay and harbor, and levelings on the banks of the Hudson river. Rept. 1858, app. 28,* pp. 204-207.

---

**Exhausted.**

New York. Schott, C. A. Report of the results of spirit leveling of precision about New York bay and vicinity in 1886 and 1887. Rept. 1887, app. 14, pp. 275–300.
Ohio. Ferguson, O. W. Resulting elevations from spirit leveling between Gibraltar, Mich., and Cincinnati, Ohio, 1899. Rept. 1899, app. 7, pp. 321–345.
Tennessee. Schott, C. A. On the results of spirit leveling of precision between Corinth, Miss., and Memphis, Tenn. Rept. 1892, pt. 2, app. 4, pp. 205–224.
United States. Hayford, J. F. Precise leveling in the United States. Rept. 1899, app. 8, pp. 347–886.
Schott, C. A. Results of the transcontinental line of geodetic spirit leveling near the parallel of 39. Part first, Sandy Hook, N. J., to St. Louis, Mo. Rept. 1882, app. 11,* pp. 517–556.
Virginia. Schott, C. A. Resulting heights from spirit leveling between Old Point Comfort and Richmond, Va., in 1884, 1891 and 1892. Rept. 1896, pt. 2, app. 2, pp. 237–246.
——— Resulting heights from spirit leveling between Richmond, Va., and Washington, D. C., 1883 and 1884, with releveling between Richmond and Fredericksburg in 1886 and verification leveling between the two cities in 1895. Rept. 1896, pt. 2, app. 3, pp. 247–260.
Wyoming. Winston, Isaac. Resulting elevations from spirit leveling between Denver, Col., and Rock Creek, Wyo., from observations between May 12 and October 21, 1899. Rept. 1899, app. 5, pp. 283–298.
*See also* Barometric hypsometry—Bench marks—Elevations—Micrometric measures—Refraction—Sea level—Tides—Triangulation—Water level.

**Leveling instrument.**
Tittmann, O. H. Instruments and methods used in the Coast and geodetic survey for precise leveling. Rept. 1879, app. 15, pp. 202–211.
Fischer, E. G. Description of precise levels Nos. 7 and 8, Coast and geodetic survey, 1900. Rept. 1900, app. 6, pp. 521–534.

**Leveling rods.**
Winston, Isaac. Leveling rods designed and constructed for use in geodetic leveling operations. Rept. 1895, pt. 2, app. 8, pp. 381, 382.

**Levels.** *See* Leveling—Sea level—Water level.

**Libby, William, jr.**
Relations of cold and warm ocean currents off the New England coast, by the U. S. Fish commission, with the co-operation of the U. S. Coast and geodetic survey. Rept. 1891, pt. 2, app. 7,* pp. 279–281.

**Lick observatory, Cal.**
Schott, Chas. A. Telegraphic determination of the longitude of a station on Mount Hamilton, Cal., and its trigonometrical connection with the Lick observatory. Rept. 1889, app. 8,* pp. 209–212.
——— Same. Bull. 13. (1889.)
*See also* Mt. Hamilton.

**Lieber, Oscar M.**
Geology of the coast of Labrador. Rept. 1860, app. 42,* pp. 402–408.

**Light-houses.**
Bache, A. D., Pourtales, L. F., and Schott, C. A. Tides, currents, magnetic variation and geographic positions of light-houses, Chesapeake bay and its rivers, 1861. Sep. pub. (1861.)*
Mitchell, Henry. A plea for a light on St. Georges bank. Rept. 1885, app. 11, pp. 483–485.
*See also* Hydrographic surveys.

**Lights.** *See* Signals.

**Lindenkohl, Adolph.**
Solution of the three-point problem, by determining the point of intersection of a side of the given triangle with a line from the opposite point to the unknown point. Rept. 1869, app. 14, p. 235.
Geology of the sea bottom in the approaches to New York bay. Rept. 1884, app. 13,* pp. 435–438.
Specific gravity of the waters of the Gulf of Mexico and the Gulf Stream. Rept. 1895, pt. 2, app. 6, pp. 355–369.
Problems of physiography, concerning salinity and temperature of the Pacific ocean. Rept. 1898, app. 9, pp. 463–473.

**Lists.** *See* Lists in Part I of this publication.

**Lithographic transfers.**
Stevens, I. I. Upon printing from lithographic transfers. Rept. 1852, app. 21,* pp. 108–111.

**Lithography.**
Hunt, E. B. Notes on lithography and lithographic transfers. Rept. 1853, app. 36,* pp. 90–93.

**Little, George.**
Blue clay of the Mississippi river. Rept. 1880, app. 12, pp. 145–171.

---

* Exhausted.

**Little Rock, Ark.—Levels—Arkansas City, Ark.**

Schott, C. A. Heights from spirit leveling of precision between Arkansas City (on the Mississippi river) and Little Rock, Ark. Rept. 1888, app. 12, pp. 455–464.

**Liverpool, Eng.—Longitude—Cambridge, Mass.**

Bond, G. P. Computations [of results] of the chronometer expeditions for determining difference of longitude between Cambridge and Liverpool. Rept. 1853, app. 34,* pp. 88, 89.

——— Result of computations of the chronometric expeditions of 1849, 1850 and 1851. Rept. 1854, app. 42,* pp. 138–142.

——— Results of the chronometric expeditions of 1855 for difference of longitude between Cambridge, Mass., and Liverpool [Eng.]. Rept. 1856, app. 23,* pp. 182–191.

Bond, W. C. Differences of longitude between Cambridge and Liverpool observatories. Rept. 1850, app. 6,* p. 79.

——— Moon culminations observed at Cambridge and the chronometer expedition for difference of longitude between Cambridge [Mass.] and Liverpool [England]. Rept. 1855, app. 43,* pp. 275, 276.

——— On moon culminations and results of the chronometer expeditions between Cambridge and Liverpool for difference of longitude. Rept. 1856, app. 22,* p. 181.

**Local deflections.** *See* Plumb line deflection.

**Log instrument.**

Trowbridge, W. P. Instrument devised by him to register depths in sounding, and distance as a log at sea. Rept. 1861, app. 11,* pp. 135–139.

**Logarithms.**

Logarithms of numbers, antilogarithms, etc. Sep. pub. (1886.)*

Duffield, W. W. Logarithms, their nature, computation, and uses, with logarithmic tables of numbers and circular functions to ten places of decimals. Part I. Rept. 1896, app. 12,* pp. 395–722.

*See also* Formulæ and factors.

**Long Island, N. Y.**

Mitchell, H. Physical survey of New York harbor and the coast of Long Island. Rept. 1859, app. 26,* pp. 311–317.

Pendleton, A. G. Encroachment of the sea on the south side of Long Island. Rept. 1850, app. 8,* pp. 80, 81.

Schott, C. A. Magnetic declination, dip and horizontal intensity [determined in 1860] on Cape Cod peninsula, Long Island and New Jersey. Rept. 1860, app. 29,* p. 352.

*See also* New England—New York.

**Long Island sound.**

Schott, C. A. Tidal currents of Long Island sound and approaches. Rept. 1854, app. 50,* pp. 168–179.

——— Method of adjustment of the secondary triangulation of Long Island sound. Rept. 1868, app. 8,* pp. 140–146.

Townshend, C. H. On an early chart of Long Island sound. Rept. 1890, app. 20, pp. 775–777.

**Longitude.** (Astronomical, chronometric, etc.).

Method of computing longitude from moon culminations. Rept. 1858, app. 21,* pp. 186–189.

Formulæ, tables and example for computing geodetic latitudes, longitudes and azimuths. Rept. 1860, app. 36,* pp. 361–391.

Same. Ed. 2, much enlarged. Title changed to Formulæ and factors for the computation of geodetic latitudes, longitudes and azimuths. Rept. 1875, app. 19,* pp. 315–368.

Same. Ed. 3. Rept. 1884, app. 7,* pp. 323–375.

Same. Ed. 4. Title changed to Formulæ and tables for the computation of geodetic positions. Rept. 1894, pt. 2, app. 9, pp. 277–348.

Time, latitude and longitude. (Leaflet printed for distribution at the Pan-American exposition, Buffalo, N. Y.) Sep. pub. (1901.)

Bond, G. P. Results of the chronometric expeditions of 1855 for difference of longitude between Cambridge, Mass., and Liverpool [Eng.]. Rept. 1856, app. 23,* pp. 182–191.

Bond, W. C. Moon culminations and other phenomena. Rept. 1857, app. 28,* pp. 310, 311.

——— On moon culminations observed by the "American method," with remarks on the performance of the spring governor. Rept. 1853, app. 32,* pp. 84–86.

Hayford, J. F. Determination of time, longitude, latitude and azimuth. Rept. 1898, app. 7, pp. 261-409.

Peirce, Benjamin. On longitudes from moon culminations. Rept. 1853, app. 31,* p. 84.

——— Longitude by moon culminations. Rept. 1854, app. 36,* pp. 108–120.

——— Method of determining longitudes by occulations of the Pleiades. Rept. 1855, app. 42,* pp. 267–274.

——— On the determination of longitude by occultations of the Pleiades. Rept. 1856, app. 24,* pp. 191–197.

——— Determination of longitudes by occultations of the Pleiades and solar eclipses. Rept. 1857, app. 29,* pp. 311–314.

---

* Exhausted.

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Peirce, Benjamin. Determination of longitudes by occultations of the Pleiades. Rept. 1861, app. 17, pp. 196–221.

——— On computations for longitudes by occultations of the Pleiades. Rept. 1864, app. 11,* p. 114.

——— Report on the progress of determining longitude from occultations of the Pleiades (continued from previous reports). Rept. 1865, app. 12,* pp. 138–146.

Peters, C. H. F. On substituting a lunar spot instead of the moon's limb in transits for determining the difference of longitude. Rept. 1856, app. 25,* pp. 198–203.

Runge, C. On photography as applied to obtain an instantaneous record of lunar distances for determinations of longitude. Rept. 1893, pt. 2, app. 4, pp. 117–124.

Sinclair, C. H. Time, latitude and longitude. No. 4 in Bull. 29. (1893.)

Walker, S. C. Longitude computations. Rept. 1848, app. 19,* pp. 112–118.

——— Same. Rept. 1866, app. 14,* pp. 102–105.

——— Abstract of reports on longitudes. Rept. 1851, app. 26,* pp. 480, 481.

——— Same. Rept. 1866, app. 17,* pp. 111, 112.

ALASKA. Schott, C. A. Abstract of resulting longitudes of some prominent stations in Alaska and adjacent parts, as astronomically determined during 1899–1895. Rept. 1895, app. 3, pp. 333–344.

——— Resulting longitudes of Kadiak, Unalaska and Unga, Alaska, as determined chronometrically from Sitka in 1896, by the party under the charge of Fremont Morse, assistant. Rept. 1897, pt. 2, app. 3, pp. 263–268.

FLORIDA. Bache, A. D., and Schott, C. A. Determination of the longitude of Fernandina, Amelia island, Florida, by means of chronometric exchanges with Savannah, Ga. Rept. 1857, app. 30,* pp. 314–324.

LABRADOR. Alexander, Stephen. Expedition to [Aulezavik island] Labrador, to observe the total eclipse of the 18th of July, 1860. Report on the determination of the magnetic elements by Edward Goodfellow, assistant, with notes by C. A. Schott, assistant. Rept. 1860, app. 21,* pp. 229–275.

TRANSATLANTIC. Bond, G. P. Computations [of results] of the chronometer expeditions for determining difference of longitude between Cambridge and Liverpool. Rept. 1853, app. 34,* pp. 88, 89.

——— Results of computation of the chronometric expeditions of 1849, 1850 and 1851. Rept. 1854, app. 42,* pp. 138–142.

——— Results of the chronometric expeditions of 1855 for difference of longitude between Cambridge, Mass., and Liverpool [England]. Rept. 1856, app. 23,* pp. 182–191.

Bond, W. C. Differences of longitude between Cambridge and Liverpool observatories. Rept. 1850, app. 6,* p. 79.

——— Moon culminations observed at Cambridge and the chronometer expedition for difference of longitude between Cambridge [Mass.] and Liverpool [England]. Rept. 1855, app. 43,* pp. 275, 276.

——— On moon culminations and results of the chronometer expeditions between Cambridge and Liverpool for difference of longitude. Rept. 1856, app. 22,* p. 181.

Peirce, Benjamin. Report upon the determination of the longitude of America and Europe from the solar eclipse of July 28, 1851. Rept. 1861, app. 16, pp. 182–195.

——— On the computations of the occultations of the Pleiades for longitude. Rept. 1862, app. 12,* pp. 155, 156.

——— Reports upon the occultations of the Pleiades in 1841-42. Rept. 1863, app. 17,* pp. 146–154.

——— Method of determining the corrections of lunar semi-diameter, mean place, ellipticity of orbit, longitude of perihelion, coefficient of annual parallax, and longitude of America and Europe. Rept. 1865, app. 13,* pp. 146–149.

WYOMING. Cutts, R. D., and Young, Chas. A. Astronomical and meteorological observations made at Sherman, Wyo. T. Rept. 1872, app. 8,* pp. 75–172.

*See also* Chronograph—Eclipse—Geographic positions—Micrometric measure—Moon culminations—Occultations—Personal equation—Plumb line deflection—Time.

## Longitude, Telegraphic.

CALIFORNIA. Schott, C. A. Telegraphic determination of the longitude of a station on Mount Hamilton, Cal., and its trigonometrical connection with the Lick observatory. [Signals with San Francisco, Cal.] Rept. 1889, app. 8,* pp. 209–212.

——— Same. Bull. 13. (1889.)

NEW YORK. Gould, B. A. Determination of longitude at Albany, N. Y. Rept. 1861, app. 18, pp. 221–232.

TRANSATLANTIC. Gould, B. A. On longitude between America and Europe from signals through the Atlantic cable. Rept. 1867, app. 6,* pp. 57–133.

Hilgard, J. E. Preliminary report on the determination of transatlantic longitudes. Rept. 1872, app. 13, pp. 227–234.

——— Transatlantic longitudes. Final report on the determination of 1872, with a review of previous determinations. Rept. 1874, app. 18, p. 163–242.

Schott, C. A. The telegraphic longitude net of the United States and its connection with that of Europe, 1866–1896. Rept. 1897, pt. 2, app. 2, pp. 197–261.

TRANSATLANTIC. Walker, S. C. Arrangement with Maine telegraph co. to determine the difference of longitude between Cambridge and Halifax. Rept. 1851, app. 18,* pp. 462, 463.

---

* Exhausted.

UNITED STATES. Telegraphic determination of the longitude of San Francisco, Cal. [Signals with Cambridge, Mass.] Rept. 1870, app. 12,* p. 100.

Difference of longitude between Harvard college observatory, Massachusetts, the Coast survey station, Seaton, and the Naval observatory, Washington, D. C., by the electric telegraph in 1867. Rept. 1870, app. 13,* pp. 101–106.

Dean, G. W. Telegraphic method of determining differences of longitude. [Wilmington, N. C., Macon, Ga., and Montgomery, Ala.] Rept. 1856, app. 21,* pp. 167–181.

Gould, B. A. Results of observations for the determination of difference of longitude by telegraph between Seaton station, Washington [D. C.] and Charleston, S. C. Rept. 1853, app. 33,* pp. 86–88.

——— On telegraphic observations for the difference of longitude between Raleigh, N. C., and Columbia, S. C. Rept. 1854, app. 41,* pp. 128–131.

——— Telegraphic operations for difference of longitude between Columbia, S. C., and Macon, Ga. Rept. 1855, app. 46,* pp. 286–295.

——— Operations for difference of longitude between Wilmington, N. C., and Montgomery, Ala. Rept. 1856, app. 20,* pp. 163–166.

——— On the progress made in the different campaigns for differences of longitude. [Washington, D. C., to New Orleans, La.] Rept. 1857, app. 27,* pp. 305–310.

——— Longitude from observations by telegraph between Calais, Me., and New Orleans, La. Rept. 1862, app. 14,* pp. 158–160.

——— On computations connected with the telegraphic method for difference of longitude. [Calais, Me , to New Orleans, La.] Rept. 1863, app. 18,* pp. 154–156.

——— On results of computation for longitude by telegraphic methods. [Seaton station, D. C., to New Orleans, La.] Rept. 1864, app. 12,* pp. 115, 116.

——— Report on the results of determining longitude by the telegraphic method. Rept. 1865, app. 14,* pp. 150, 151.

Schott, C. A. Telegraphic longitude of Key West. [Signals with Washington, D. C.] Rept. 1875, app. 9,* pp. 139, 156.

——— Determination of longitude by means of the electric telegraph. [Nashville, Tenn., and Atlanta, Ga.] Rept. 1880, app. 14,* pt. 2, pp. 229–241.

——— Results of the longitudes of the Coast and geodetic survey determined up to the present time by the electric telegraph with preliminary adjustment. Rept. 1880, app. 6, pp. 81–92.

——— Longitudes deduced in the Coast and geodetic survey from determinations by means of the electric telegraph, between the years 1846 and 1885. Second adjustment. Rept. 1884, app. 11, pp. 407–430.

——— The telegraphic longitude net of the United States and its connection with that of Europe, 1866–1896. Rept. 1897, pt. 2, app. 2, pp. 197–261.

Walker, S. C. Differences of longitude by telegraph. [Philadelphia, Pa. Jersey City, N. J., and Washington, D. C.] Rept. 1846, app. 11,* pp. 72–74.

——— Same. Rept. 1866, app. 13,* pp. 100–102.

——— Difference of longitude of Philadelphia and Greenwich, by reduction of observations at Cambridge, Mass. Rept, 1846, app. 10,* pp. 71, 72.

——— Same. Rept. 1866, app. 12,* pp. 99, 100.

——— Telegraphic operations and computations. Rept. 1850, app. 13,* pp. 85–89.

——— Same. Rept. 1866, app. 15,* pp. 106–108.

*See also* Electro-magnetism—Transmission time—Time.

**Longitude instruments.**

Smith, Edwin. Apparatus used for observations of telegraphic longitudes. Rept. 1880, app. 7, pp. 93–95.

——— Two new portable instruments for longitude work. Rept. 1889, app. 9,* pp. 213–216.

——— Same. Bull. 16. (1889.)

*See also* Telegraph—Transit instrument.

**Longs Peak, Colo.**

Cutts, R. D., and Young, Chas. A. Astronomical and meteorological observations made at Sherman, Wyo. T. Rept. 1872, app. 8,* pp. 75–172.

**Los Angeles, Cal.**

Schott, C. A. Results from the magnetic observatory of the Coast and geodetic survey at Los Angeles, Cal., between the years 1882–1889.

Part I. Results of the absolute measures of the direction and intensity of the earth's magnetic force. Rept. 1890, app. 8, pp. 109–241.

Part II. Results of the differential measures of the magnetic declination. Rept. 1890, app. 9, pp. 243–457.

Part III. Results of the differential measures of the horizontal intensity. Rept. 1891, pt. 2, app. 4, pp. 41–267.

Part IV. Results of the differential measures of the vertical force component and of the variations of dip and total force. Rept. 1892, pt. 2, app. 7, pp. 253–327.

**Los Angeles base, Cal.**

Davidson, George. Measurement of the Los Angeles base line, Los Angeles and Orange counties, Cal. Rept. 1889, app. 10, pp. 217–231.

---

* Exhausted.

**Louisiana.**

LEVELING. Schott, C. A. Heights from spirit levelings of precision between Mobile, Ala., and New Orleans (Carrollton), La., 1885-86. Rept. 1887, app. 9, pp. 185-205.

——— Heights from spirit leveling of precision between New Orleans, La., and Arkansas City, Ark. Rept. 1888, app. 11, p. 427-453.

RECONNAISSANCE. Gerdes, F. H. Reconnaissance of the coast of Louisiana in 1854. Rept. 1854, app. 20,* pp. 28-30.

*See also* Cubitts gap—Gulf coast—Gulf Stream—Mississippi river—New Orleans.

**Louisville, Ky.** *See* Southern exposition.

**Lower California.** *See* Mexico.

**Lull, Edward Phelps.**

A table of depths for the harbors of the coast of the United States. Rept. 1883, app. 7, pp. 137-237.

**Lunar distances.**

Runge, C. On photography as applied to obtain an instantaneous record of lunar distances for determinations of longitude. Rept. 1893, pt. 2, app. 4, pp. 117-124.

**Lunar spots.**

Peters, C. H. F. On substituting a lunar spot instead of the moon's limb in transits for determining the difference of longitude. Rept. 1856, app. 25,* pp. 198-203.

*See also* Moon.

**Lunar tables.**

Peirce, Benjamin. Upon the tables of the moon used in the reduction of the Pleiades. Rept. 1862, app. 13,* pp. 157, 158.

**Lunar transits.** *See* Moon culminations.

**Lunar variation.** *See* Magnetic variations.

**McArthur, William P.**

Report accompanying a reconnaissance chart of the western coast of the United States, from Monterey, Cal., to the Columbia river, Oregon. Rept. 1850, app. 31,* pp. 119-121.

**Macon, Ga.—Longitude—Columbia, S. C.**

Gould, B. A. Telegraphic operations for difference of longitude between Columbia, S. C., and Macon, Ga. Rept. 1855, app. 46,* pp. 286-295.

**Madison, Wis.**

Schott, C. A. Magnetic observatory at Madison, Wis. Rept. 1877, app. 7,* pp. 96, 97.

**Maffitt, John N.**

Beaufort harbor, North Carolina. Rept. 1854, app. 14,* pp. 21-23.

Comparative chart of Maffitt's channel, Charleston harbor. Rept. 1855, app. 15,* pp. 155-157.

Re-examination of the bar and entrances to Cape Fear river, North Carolina. Rept. 1857, app. 17,* pp. 153-156.

**Maffitt's channel, S. C.**

Maffitt, J. N. Comparative chart of Maffitt's channel, Charleston harbor. Rept. 1855, app. 15,* pp. 155-157.

**Magnet.** *See* Compass—Electro-magnetism.

**Magnetic declination.**

Table of magnetic declination. Rept. 1854, app. 43,* pp. 142-145.

Table for navigators showing variation of the compass for 1858, compiled from chart of F. J. Evans, R. N. Rept. 1859, app. 16,* pp. 172-175.

Bauer, L. A. United States magnetic declination tables and isogonic charts for 1902 and principal facts relating to the earth's magnetism. Sep. pub. (1902.)

Schott, C. A. The value of the "Arcano del Mare" with reference to magnetic declination in the seventeenth century. Rept. 1888, app. 6,* pt. 1, pp. 167-170.

——— Same. Bull. 5. (1888.)

ALASKA. Dall, W. H. Geographical and hydrographical explorations on the coast of Alaska. Rept. 1873, app. 11, pp. 111-122.

Putnam, G. R. Physical observations made in connection with the Pribilof islands survey of 1897. Rept 1898, app. 5, pp. 233-241.

Schott, C. A. The distribution of the magnetic declination in the United States for the epoch 1890. Rept. 1889, app. 11, pp. 233-402.

——— Distribution of the magnetic declination in Alaska and adjacent waters for 1895, and construction of an isogonic chart for the same epoch. Rept. 1894, pt. 2, app. 4, pp. 87-100.

——— Same, abstract. Bull. 34. (1895.)

---

* Exhausted.

Asia. Schott, C. A. On the magnetic observations made during Bering's first voyage to the coasts of Kamchatka and Eastern Asia in the years 1725–1730. Rept. 1891, pt. 2, app. 5, pp. 269–273.

——— Same. Bull. 20. (1891.)

Atlantic ocean. Schott, C. A. Variation of the compass off the Bahama islands at the time of the landfall of Columbus in 1492. Rept. 1880, app. 19, pp. 412–417.

California. Davidson, George. Magnetic variations off the coasts of California and Mexico, observed by Spanish navigators in the last quarter of the eighteenth century. Rept. 1885, app. 7, pp. 275–284.

Schott, C. A. Results of the differential measures of the magnetic declination. (Results from the magnetic observatory of the Coast and geodetic survey at Los Angeles, Cal., between the years 1882–1889. Part II.) Rept. 1890, app. 9, pp. 243–457.

——— The direction and intensity of the earth's magnetic force at San Francisco, Cal. Bull. 33. (1895.)

Chesapeake bay. Bache, A. D., Pourtales, L. F., and Schott, C. A. Tides, currents, magnetic variation, and geographic positions of light-houses. Chesapeake bay and its rivers. Sep. pub. (1861.)*

Georgia. Schott, C. A. Distribution of the magnetic declination on the coasts of Virginia, North Carolina, South Carolina and Georgia, with a chart of the isogonic curves for 1860. Rept. 1861, app. 24, pp. 256–259.

Gulf of Mexico. Gerdes, F. H. Extract from a letter upon the change in the magnetic variation within short distances in the Gulf of Mexico. Rept. 1845, app. 3,* pp. 41–43.

Mexico. Davidson, George. Magnetic variations off the coasts of California and Mexico, observed by Spanish navigators in the last quarter of the eighteenth century. Rept. 1885, app. 7, pp. 275–284.

North Carolina. Baylor, James B., and Hazard, Daniel L. General report on the magnetic survey of North Carolina, with a brief historical sketch of the fundamental phenomena of the earth's magnetism. Rept. 1899, app. 9, pp. 887–938.

Hazard, D. L. Magnetic survey of North Carolina. Values of the magnetic declination at the county seats from 1750 to 1910. Bull. 41. (1901.)

United States. Bache, A. D., and Hilgard, J. E. Table of magnetic declinations [in geographical order from Coast survey observations]. Rept. 1855, app. 47,* pp. 295–306.

Hilgard, J. E. Chart of magnetic declination in the United States, 1875. Rept. 1876, app. 21, pp. 400, 401.

——— Report on the distribution of the magnetic declination on the coast and parts of the interior of the United States [with accompanying isogonic and isomagnetic chart] for 1870. Rept. 1865, app. 19,* pp. 174–176.

——— Distribution of the magnetic declination in the United States at the epoch, January, 1885, with three isogonic charts. Rept. 1882, app. 13*, pp. 277–328.

——— The distribution of the magnetic declination in the United States for the epoch 1890. Rept. 1889, app. 11, pp. 233–402.

——— Distribution of the magnetic declination in the United States for the epoch January 1, 1900. Rept. 1896, pt. 2, app. 1, pp. 147–235.

——— (And Dean, G. W.) Results from observations for magnetic declination, dip, and intensity in Maine and Connecticut, including also a station in the District of Columbia. Rept. 1863, app. 22,* p. 204.

*See also* Magnetic elements—Magnetic variations—Terrestrial magnetism.

**Magnetic differential measures.** *See* Magnetic variation.

**Magnetic distribution.** *See* Magnetic declination—Magnetic elements—Magnetic inclination—Magnetic intensity—Magnetic surveys.

**Magnetic elements.** (Declination, inclination, and intensity.)

Schott, C. A. Magnetic declination, dip, and intensity in 1859. Rept. 1859, app. 23,* p. 296.

Hilgard, J. E., and Blair, H. W. Records and results of magnetic observations made at the charge of the "Bache fund" of the National academy of sciences, from 1871 to 1876. Rept. 1882, app. 14, pp. 329–426.

Africa. Preston, E. D. Results of observations made to determine gravity and the magnetic elements at stations on the west coast of Africa and on some islands in the North and South Atlantic, 1889–1890. Rept. 1890, app. 12, pp. 625–684.

——— Same. Bull. 22. (1891.)

Alaska. Reid, H. F. Report of an expedition to Muir glacier, Alaska, with determinations of latitude and the magnetic elements at Camp Muir, Glacier bay. Rept. 1891, pt. 2, app. 14, pp. 487–501.

Schott, C. A. Results of magnetic observations in Alaska and in the Northwest territory of the Dominion of Canada. Rept. 1892, pt. 2, app. 11, pp. 529–533.

Atlantic islands. Preston, E. D. Results of observations made to determine gravity and the magnetic elements at stations on the west coast of Africa, and on some islands in the north and south Atlantic, 1889–1890. Bull. 22. (1891.)

California. Schott, C. A.- Results from the magnetic observatory of the Coast and geodetic survey, at Los Angeles, Cal., between the years 1882–1889.

Part I. Rept. 1890, app. 8, pp. 199–241.
Part II. Rept. 1890, app. 9, pp. 243–457.
Part III. Rept. 1891, pt. 2, app. 4, pp. 41–267.
Part IV. Rept. 1892, pt. 2, app. 7, pp. 253–327.

---

*Exhausted.

CALIFORNIA. Schott, C. A. The direction and intensity of the earth's magnetic force at San Francisco, Cal. Bull. 33. (1895.)

CANADA. Schott, C. A. Magnetic declination, dip, and intensity in 1859. Rept. 1859, app. 23,* p. 296.

——— Results of magnetic observations at stations in Alaska and in the Northwest territory of the Dominion of Canada. Rept. 1892, pt. 2, app. 11, pp. 529–533.

CAROLINE ISLAND. Preston, E. D. Results of observations made to determine gravity and the magnetic elements at stations on the west coast of Africa, and on some islands in the north and south Atlantic. Bull. 22. (1891.)

CHATHAM ISLAND. Smith, Edwin. Transit of Venus, Chatham island, 1874. Rept. 1875, app. 14,* pp. 231–248.

DISTRICT OF COLUMBIA. Schott, C. A. Report on the results from the observations made at the magnetic observatory on Capitol hill, Washington, D. C., between 1867 and 1869. Rept. 1869, app. 9, pp. 199–207.

GREENLAND. Putnam, G. R. Results of magnetic observations made in connection with the Greenland expedition of 1896, under charge of Prof. A. E. Burton. Rept. 1897, pt. 2, app. 5, pp. 285–295.

HAWAII. Preston, E. D. Observations for the variation of latitude, made near Honolulu, Oahu, Hawaiian islands, in co-operation with the work of the International geodetic association, and on the determination of gravity and the magnetic elements. Rept. 1891, pt. 2, app. 13, pp. 479–485.

——— Determinations of latitude, gravity, and magnetic elements at stations in the Hawaiian islands, including a result for the mean density of the earth, 1891, 1892. Rept. 1893, pt. 2, app. 12, pp. 509–638.

LABRADOR. Alexander, Stephen. Expedition to [Aulezavik island] Labrador, to observe the total eclipse of the 18th of July, 1860, [and] report on the determination of the magnetic elements by Edward Goodfellow, assistant, with notes by C. A. Schott, assistant. Rept. 1860, app. 21,* pp. 268–271.

MAINE. Pourtales, L. F. Magnetic station at Eastport, Me. Rept. 1860, app. 27,* pp. 350, 351.

UNITED STATES. List of magnetic stations and results. Rept. 1858, app. 24,* pp. 191, 192.

Continuation of list of magnetic stations and results. Rept. 1860, app 28,* pp. 351, 352.

Magnetic stations and results (supplementary to lists given in annual reports of 1856, 1858, and 1860, pp. 351, 352). Rept. 1862, app. 20,* pp. 230, 231.

Bache, A. D. Abstract of results of a magnetic survey of Pennsylvania and parts of adjacent states in 1840 and 1841, with some additional results of 1843 and 1862. Rept. 1862, app. 19, pp. 212–229.

——— Results of magnetic observations made in the United States by Prof. J. N. Nicollet between 1832 and 1836. Rept. 1864, app. 19,* pp. 207–210.

——— (And Hilgard, J. E.) On the general distribution of terrestrial magnetism in the United States. Rept. 1856, app. 28,* pp. 209–225.

Schott, C. A. Results for declination, dip, and horizontal intensity. Rept. 1855, app. 49,* p. 337.

——— Magnetic observations made at stations in Delaware, Maryland, and Virginia. Rept. 1856, app. 29,* pp. 226, 227.

——— Results of observations for magnetic declination, dip, and intensity at stations in Section III [Delaware, Maryland, and Virginia]. Rept. 1856, app. 30,* p. 227.

——— Magnetic declination, dip, and intensity in 1859. Rept. 1859,* app. 23, p. 296.

——— Magnetic declination, dip, and horizontal intensity [determined in 1860] on Cape Cod peninsula, Long island, and New Jersey. Rept. 1860, app. 29,* p. 352.

——— Results for magnetic declination, dip, and horizontal intensity in Pennsylvania, in the District of Columbia, and in New York. Rept. 1862, app. 18,* p. 212.

——— Declination, dip, and intensity, from observations made by the U. S. Coast and geodetic survey between 1833 and 1882, July. Rept. 1881, app. 9, pp. 159–224.

——— (And Dean, G. W.) Results from observations for magnetic declination, dip, and intensity in Maine and Connecticut, including also a station in the District of Columbia. Rept. 1863, app. 22,* p. 204.

WYOMING. Cutts, R. D., and Young, Charles A. Astronomical and meteorological observations made at Sherman, Wyo. T. Rept. 1872, app. 8,* pp. 75–172.

**Magnetic disturbances.** *See* Magnetic variations.

**Magnetic horizontal intensity.** *See* Magnetic intensity.

**Magnetic inclination.**

CALIFORNIA. Schott, C. A. Results of the differential measures of the vertical force component and of the variations of dip and total force. (Results of the observations recorded at the U. S. Coast and geodetic survey magnetic observatory, Los Angeles, Cal., 1882–1889.) Part IV. Rept. 1892, pt. 2, app. 7, pp. 253–327.

The direction and intensity of the earth's magnetic force at San Francisco, Cal. Bull. 33. (1895.)

DISTRICT OF COLUMBIA. Schott, C. A. Secular variation of the magnetic variation and dip at Washington, D. C. Rept. 1858, app. 26,* pp. 195–197.

UNITED STATES. Schott, C. A. Geographical distribution and secular variation of the magnetic dip and intensity in the United States. Rept. 1885, app. 6, pp. 129–274.

---

* Exhausted.

UNITED STATES. Schott, C. A. Distribution of the magnetic dip and the magnetic intensity in the United States for the epoch January 1, 1900. Rept. 1897, pt. 2, app. 1, pp. 159–196.
*See also* Magnetic elements—Magnetic variations—Terrestrial magnetism.

**Magnetic instruments.**
Schott, C. A. Magnetic observations by means of portable instruments. Rept. 1872, app. 14,* pp. 235–254.
——— Same. Ed. 2. Title changed to Terrestrial magnetism. Instructions for magnetical observations. Rept. 1875, app. 16,* pp. 254–278.
——— Same. Ed. 3. Title changed to Directions for magnetic observations with portable instruments. Rept. 1881, app. 8, pp. 126–158.
*See also* Dip instrument—Magnetic needle—Magnetometer.

**Magnetic intensity.**
CALIFORNIA. Schott, C. A. Results of the observations recorded at the U. S. Coast and geodetic survey magnetic observatory, at Los Angeles, Cal.

Part III. Results of the differential measures of the horizontal intensity. Rept. 1891, pt. 2, app. 4, pp. 41–267.
Part IV. Results of the differential measures of the vertical force component and of the variations of dip and total force. Rept. 1892, pt. 2, app. 7, pp. 253–327.

UNITED STATES. Schott, C. A. Geographical distribution and secular variation of the magnetic dip and intensity in the United States. Rept. 1885, app. 6, pp. 129–274.
——— Distribution of the magnetic dip and the magnetic intensity in the United States for the epoch January 1, 1900. Ed. 2. Rept. 1897, pt. 2, app. 1, pp. 159–196.
*See also* Magnetic elements—Magnetic variations—Terrestrial magnetism.

**Magnetic method.**
Schott, C. A. Magnetic observations by means of portable instruments. Rept. 1872, app. 14,* pp. 235–254.
——— Same. Ed. 2. Title changed to Instructions for magnetical observations. Rept. 1875, app. 16,* pp. 254–278.
——— Same. Ed. 3. Title changed to Directions for magnetic observations with portable instruments. Rept. 1881, app. 8, pp. 126–158.

**Magnetic needle.**
Hilgard, J. E. On the action of sea water on metals used in the construction of instruments and on magnetic needles. Rept. 1854, app. 55,* pp. 192, 193.
——— Description of a new mode of constructing the axle of a magnetic dipping needle. Rept. 1862, app. 23,* pp. 236–238.
Schott, C. A. Directions for magnetic observations with portable instruments. Rept. 1881, app. 8, pp. 126–158.
*See also* Magnetic variations.

**Magnetic observations.** *See* Terrestrial magnetism.

**Magnetic observatories.** Bauer, L. A. Magnetic declination tables. Sep. pub. (1902)
Schott, C. A. Magnetic observatory at Madison, Wis. Rept. 1877, app. 7,* pp. 96, 97.
Pourtales, L. F. Magnetic station at Eastport, Maine. Rept. 1860, app. 27,* pp. 350, 351.
Trowbridge, W. P. Magnetic station at Key West, Florida reef. Rept. 1860, app. 26,* pp. 326–349.
*See also* Girard college observatory, Pa.—Los Angeles observatory, Cal.

**Magnetic ranges.**
Gillmore, J. C. Magnetic ranges for determining the deviation of the compass, with short explanations of how to find the deviation and error of the compass, in the Bay of San Francisco, Cal. Sp. pub. 1. (1898.)

**Magnetic surveys.**
Bauer, L. A. The magnetic work of the United States Coast and geodetic survey. Rept. 1899, app. 10, pp. 939–952.
Schott, C. A. Historical review of the work of the Coast and geodetic survey in connection with terrestrial magnetism. Rept. 1888, app. 6,* pt. 2, pp. 171–176.
——— Same. Bull 7. (1888.)
NORTH CAROLINA. Baylor, James B., and Hazard, Daniel L. General report on the magnetic survey of North Carolina, with a brief historical sketch. Rept. 1899, app. 9, pp. 887–938.
Hazard, D. L. Magnetic survey of North Carolina. Values of the magnetic declination at the county seats from 1750 to 1910. Bull. 41. (1901.)
PENNSYLVANIA. Bache, A. D. Abstract of results of a magnetic survey of Pennsylvania and parts of adjacent states in 1840 and 1841, with some additional results of 1843 and 1862. Rept. 1862, app. 19,* pp. 212–229.
*See also* Terrestrial magnetism.

**Magnetic variations.** (Diurnal, etc.)
Evans, F. J., R. N. Table for navigators showing variation of the compass for 1858 compiled from chart of F. J. Evans, R. N. Rept. 1859, app. 16,* pp. 172–175.

---

* Exhausted.

Schott, C. A. Development of Bessel's function for periods frequently occurring in magnetic and meteorological investigations, with examples. Rept. 1862, app. 22,* pp. 232–235.

ARCTIC REGIONS. Schott, C. A. Magnetic observations under direction of the Survey, in co-operation with the U. S. Signal office, at the U. S. Polar station, Ooglaamie, Point Barrow, Alaska. Rept. 1883, app. 13, pp. 323–365.

——— Magnetic work of the Greely arctic expedition. Rept. 1887, app. 10, pp. 207–210.

ARIZONA. Schott, C. A. Observations for daily variation of the magnetic declination made at Fort Steilacoom, Washington territory, in 1866 and at Camp Date creek, Arizona, in 1867. Rept. 1870, app. 15,* pp. 111–114.

CALIFORNIA. Schott, C. A. Results of the observations recorded at the U. S. Coast and geodetic survey magnetic observatory at Los Angeles, Cal., 1882–1889.

Part I. Results of the absolute measures of the direction and intensity of the earth's magnetic force. Rept. 1890, app. 8, pp. 199–241.

Part II. Results of the differential measures of the magnetic declination. Rept. 1890, app. 9, pp. 243–457.

Part III. Results of the differential measures of the horizontal intensity. Rept. 1891, pt. 2, app. 4, pp. 41–267.

Part IV. Results of the differential measures of the vertical force component and of the variations of dip and total force. Rept. 1892, pt. 2, app. 7, pp. 253–327.

DISTRICT OF COLUMBIA. Schott, C. A. Report on the results from the observations made at the magnetical observatory on Capitol hill, Washington, D. C., between 1867 and 1869. Rept. 1869, app. 9, pp. 199–207.

FLORIDA. Schott, C. A. Observations of terrestrial magnetism at Key West, Fla., made between 1860 and 1866. Rept. 1874, app. 9,* pp. 109–130.

MAINE. Results of magnetical observations made at Eastport, Me., between 1860 and 1864. Rept. 1865, app. 18,* pp. 166–174.

PENNSYLVANIA. Bache, A. D. Discussion of the magnetic and meteorological observations made at the Girard college observatory, Philadelphia, in 1840, 1841, 1842, 1843, 1844 and 1845.

Part I. Investigation of the eleven-year period in the amplitude of the solar-diurnal variation and of the disturbances of the magnetic declination. Rept. 1859, app. 22,* pp. 278–295.

Part II. Investigation of the solar diurnal variation in the magnetic variation, and its annual inequality. Rept. 1860, app. 23,* pp. 293–312.

Part III. Investigation of the influence of the moon on the magnetic declination. Rept. 1860, app. 24,* pp. 312–324.

Part IV. Investigation of the eleven (or ten) year period and of the disturbances of the horizontal component of the magnetic force. Rept. 1862, app. 15,* pp. 161–186.

Part V. Investigation of the solar-diurnal variation and of the annual inequality of the horizontal component of the magnetic force. Rept. 1862, app. 16,* pp. 186–202.

Part VI. Investigation of the influence of the moon on the magnetic horizontal force. Rept. 1862, app. 17,* pp. 202–212.

Part VII. Investigation of the eleven-year period, and of the disturbances of the vertical component of the magnetic force, with a supplement on the effect of auroral lights. Rept. 1863, app. 19,* pp. 156–183.

Part VIII. Investigation of the solar-diurnal variation and of the annual inequality of the vertical component of the magnetic force. Rept. 1863, app. 20,* pp. 183–195.

Part IX. Investigation of the influence of the moon on the magnetic vertical force. Rept. 1863, app. 21,* pp. 196–204.

Part X. Analysis of the disturbances of the dip and total force. Rept. 1864, app. 16,* pp. 183–190.

Part XI. Solar diurnal variation and annual inequality of the inclination and total force. Rept. 1864, app. 17,* pp. 191–199.

Part XII. Discussion of the magnetic inclination and table of absolute values of the declination, inclination, and intensity between 1841 and 1845. Rept. 1864, app. 18,* pp. 199–206.

WASHINGTON. Schott, C. A. Observations for daily variation of the magnetic declination, made at Fort Steilacoom, Washington territory, in 1866 and at Camp Date creek, in Arizona in 1867. Rept. 1870, app. 15,* pp. 111–114.

*See also* Magnetic declination—Magnetic elements—Magnetic inclination—Magnetic intensity—Magnetic variation, Secular.

**Magnetic variations, Secular.**

AFRICA. Schott, C. A. The secular variation and annual change of the magnetic force at stations occupied in connection with U. S. Eclipse expedition to the west coast of Africa in 1889–1890. Rept. 1891, pt. 2, app. 3, pp. 21–39.

——— Same. Bull. 23. (1891.)

ATLANTIC OCEAN. Schott, C. A. Secular variation in the position of the agonic line of the North Atlantic and of America, between 1500 and 1900 A. D. Bull. 6. (1888.)

DISTRICT OF COLUMBIA. Schott, C. A. Secular variation of magnetic declination and dip, at Washington, D. C. Rept. 1858, app. 26,* pp. 195–197.

——— Secular changes in the declination, dip, and intensity of the magnetic force at Washington, D. C. Rept. 1870, app. 14,* pp. 107–110.

PENNSYLVANIA. Schott, C. A. Intermediate period in the secular change of magnetic declination at Hatboro, Pennsylvania. Rept. 1858, app. 25,* pp. 192–195.

UNITED STATES. Schott. C. A. Discussion of the secular change in the magnetic declination on the Atlantic and part of the Gulf coasts of the United States. [Ed. 1.] Rept. 1855, app. 48,* pp. 306–337.

Above is supplemented by the two following:

——— Secular change of the magnetic declination on the western coast. Rept. 1856, app. 31,* pp. 228–235.

---

* Exhausted.

UNITED STATES. Schott, C. A. Secular change of the magnetic declination accompanied by tables showing the variation of the needle on the coasts of the United States for every tenth year from the date of the earliest reliable observation. Rept. 1859, app. 24,* pp. 296–305.

Ed. 1 includes the three preceding entries.

——— Same. Ed. 2. Title changed to Secular change of magnetic declination in the United States and other parts of North America; new discussion. Rept. 1874, app. 8,* pp. 72–108.

——— Same. Ed. 3. Sep. pub. (1879.)*

——— Same. Ed. 4. Rept. 1879, app. 9,* pp. 124–174.

——— Same. Ed. 5. Rept. 1882, app. 12,* pp. 211–276.

——— Same. Ed. 6, greatly enlarged (Apr. 1887). Rept. 1886, app. 12, pp. 291–407.

——— Same. Ed. 7 (June, 1889). Rept. 1888, app. 7, pp. 177–312.

——— Same. Ed. 8. Title changed to The secular variation in direction and intensity of the earth's magnetic force in the United States and in some adjacent countries. Rept. 1895, pt. 2, app. 1, pp. 167–320.

——— Results for declination, dip, and horizontal intensity. Rept. 1855, app. 49,* p. 337.

——— Secular variation of the magnetic inclination in the Northeastern states. Rept. 1856, app. 32,* pp. 235–245.

——— Secular variation of the magnetic inclination on the western coast of the United States. Rept. 1856, app. 33,* pp. 246–249.

——— Secular change of magnetic intensity on the Atlantic, Gulf and Pacific coasts of the United States; intensity statistics; notes; table of annual change for Atlantic and Pacific groups. Rept. 1861, app. 22, pp. 242–251.

——— Geographical distribution and secular variation of the magnetic dip and intensity in the United States. Rept. 1885, app. 6, pp. 129–274.

*See also* Magnetic declination—Magnetic elements—Magnetic inclination—Magnetic intensity—Magnetic variations—Terrestrial magnetism.

**Magnetics.** *See* Terrestrial magnetism.

**Magnetometer.**

Schott, C. A. Directions for magnetic observations with portable instruments. Rept. 1881, app. 8, pp. 126–158.

Smith, E. Notes on some instruments recently made in the instrument division. Rept. 1894, pt. 2, app. 8, pp. 263–275.

*See also* Magnetic instruments.

**Maine.**

GEOGRAPHIC NAMES. Ballard, E. Geographical names on the coast of Maine. Rept. 1868, app. 14,* pp. 243–259.

LEVELING. Schott, C. A. Atmospheric refraction and adjustment of hypsometric measures—Contribution No. II. Determination of several heights by the spirit level, and measures of refraction by zenith distances, also, observations of the barometer at Ragged mountain, Maine, by F. W. Perkins. Rept. 1876, app. 17, pp. 355–367.

TERRESTRIAL MAGNETISM. Schott, C. A., and Dean, G. W. Results from observations for magnetic declination, dip, and intensity, in Maine and Connecticut, including also a station in the District of Columbia. Rept. 1863, app. 22,* p. 204.

*See also* Atlantic coast—Calais—Eastport—Epping base—Gulf of Maine—New England—Nantucket arc—Penobscot bay—Portland harbor.

**Maine telegraph company.**

Walker, S. C. Arrangement with Maine telegraph co. to determine the difference of longitude between Cambridge and Halifax. Rept. 1851, app. 18,* pp. 462, 463.

**Manhattan island, N. Y.**

Gerdes, F. H. Topographical survey of Manhattan island. Rept. 1855, app. 21,* pp. 162, 163.

**Maps.**

ALASKA. Dall, W. H. Notes on an original manuscript chart of Bering's expedition of 1725–30, and on an original manuscript chart of his second expedition; together with a summary of a journal of the first expedition, kept by Peter Chaplin, and now first rendered into English from Bergh's Russian version. Rept. 1890, app. 19, pp. 759–774.

AMERICA. Schott, C. A. The value of the "Arcano del Mare" with reference to magnetic declination in the seventeenth century. Rept. 1888, app. 6,* pt. 1, pp. 167–170.

——— Same. Bull. 5. (1888.)

NEW YORK. Boschke, A. [Comparative maps] of New York harbor. Rept. 1856, app. 48,* pp. 281, 282.

——— Report on the drawing of maps of New York harbor, made for the Commissioners on harbor encroachments. Rept. 1857, app. 38,* pp. 373, 374.

——— Report to Commissioners on the preservation of New York harbor from encroachment by the Advisory council on the comparative map of New York bay and harbor and approaches. Prepared by the Coast survey. Rept. 1857, app. 37,* pp. 358–373.

Townsend, C. H. On an early chart of Long Island sound. Rept. 1890, app. 20, pp. 775–777.

PHILIPPINE ISLANDS. Atlas of the Philippine islands. Sp. pub. 3. (1900.)*

UNITED STATES. Tidball, J. C. Description of the "Congress" map. Rept. 1855, app. 39,* pp. 253–255.

*See also* Charts—Projections. *See also* List of Catalogues of maps and charts in Part I.

---

*Exhausted.

**Marindin, Henry Louis.**
Apparatus for observing currents in connection with the physical survey of the Mississippi river. Rept. 1877, app. 9, pp. 104–107.
Comparison of the surveys of Delaware river in front of Philadelphia, 1843 and 1878. Rept. 1880, app. 9, pp. 110–125.
Comparison of surveys of Mississippi river in the vicinity of Cubitt's gap. Rept. 1880, app. 10, pp. 126–134.
Comparison of the survey of the Delaware river of 1819, between Petty's and Tinicum islands, with more recent surveys. Rept. 1882, app. 15, pp. 427–432.
Physical hydrography of Delaware river and bay—comparison of recent with former surveys. Rept. 1884, app. 12, pp. 431–434.
Comparison of transverse sections in the Delaware river between old Navy yard and east end of Petty's island, for the years 1819, 1843, and 1878. Rept. 1885, app. 12, pp. 487, 488.
Tide levels and flow of currents in New York bay and harbor. Rept. 1888, app. 9, pp. 405–408.
Same. Bull. 3. (1888.)
Encroachment of the sea upon the coast of Cape Cod, Mass., as shown by comparative surveys. Rept. 1889, app. 12, pp. 403–407.
Cross-sections of the shore of Cape Cod between Chatham and the Highland light-house. Rept. 1889, app. 13, pp. 409–457.
A syphon tide-gauge for the open seacoast. Bull. 12. (1889.)
Changes in the shore line and anchorage areas of Cape Cod (or Provincetown) harbor by comparison of surveys between 1835, 1867, and 1890. Rept. 1891, pt. 2, app. 8, pp. 283–288.
Changes in the shore lines and anchorage areas of Cape Cod (or Provincetown) harbor, as shown by a comparison of surveys made between 1867 and 1890. Bull. 24. (1891.)
Cross sections of the shore of Cape Cod, Mass., between the Cape Cod and Long Point light-houses. Rept. 1891, pt. 2, app. 9, pp. 289–341.
Tides and currents in the harbor of Edgartown and Katama bay, Martha's Vineyard. Rept. 1892, pt. 2, app. 5, pp. 225–241.
Changes in the shore lines of Nantucket island, Mass., from a comparison of surveys 1846 to 1887 and in 1891. Rept. 1892, pt. 2, app. 6, pp. 243–252.
Changes in the depths of the bar at the entrance to Nantucket inner harbor, Mass., between 1888 and 1893. Rept. 1895, pt. 2, app. 5, pp. 347–354.
Tables of cross sections on the north shores of Nantucket and Martha's Vineyard, Mass. Rept. 1896, pt. 2, app. 8,* pp. 305–346.

**Marine engineering.**
*See* Boilers—Engines—Steamers.

**Marine governors.**
Emery, Charles E. On marine governors. Rept. 1876, app. 13,* pp. 192–196.

**Marking.**
Tittmann, O. H. On a method of readily transferring the underground mark at a base monument. Rept. 1881, app. 13, pp. 357, 358.
*See also* Bench marks.

**Marr, Robert Athelstone.**
Transit of Venus of December 6, 1882, observed at Lehman's ranch, Nevada. Rept. 1883, app. 16, p. 378.

**Mars.**
Davidson, G. Observed occultations of $\alpha$ Scorpii and the planet Mars at Point Hudson, Port Townshend, Washington territory, April and May, 1856. Rept. 1856, app. 26,* pp. 203–208.

**Marshes.** *See* Hydrographic surveys—Physical hydrography—Sea level.

**Martha's Vineyard.**
Marindin, H. Cross sections on the north shores of Nantucket and Martha's Vineyard, Mass. Rept. 1896, pt. 2, app. 8,* pp. 305–346.
Whiting, Henry L. Report of changes in the shore line and beaches of Martha's Vineyard, as derived from comparisons of recent with former surveys. Rept. 1886, app. 9, pp. 263–266.
——— (And Mitchell, H.) Reports concerning Martha's Vineyard and Nantucket. Rept. 1869, app. 15,* pp. 236–259.
*See also* Edgartown—Muskeget channel—Nantucket sound—Vineyard sound.

**Martha's Vineyard sound.** *See* Vineyard sound.

**Maryland.**
BOUNDARY. Whiting, Henry L. Report in relation to a portion of boundary line in dispute between the states of Maryland and Virginia. Rept. 1890, app. 11, pp. 621–623.
LEVELING. Schott, C. A. Result of spirit leveling between tide water at Annapolis, Md., and the Capitol bench mark at Washington, D. C. Rept. 1889, app. 15, pp. 461–466.
——— Resulting heights from spirit leveling between Washington, D. C., and Hagerstown, Md., 1883. Rept. 1896, pt. 2, app. 4, pp. 261–264.
TERRESTRIAL MAGNETISM. Schott, C. A. Magnetic observations made at stations in Delaware, Maryland, and Virginia. Rept. 1856, app. 29,* pp. 226, 227.

---

*Exhausted.

TERRESTRIAL MAGNETISM. Schott, C. A. Results of observations for magnetic declination, dip and intensity at stations in Section III [Delaware, Maryland, and Virginia]. Rept. 1856, app. 30,* p. 227.

TRIANGULATION. Schott, C. A. Connection of the primary base lines on Kent island, Md., and on Craney island, Va., and on the degree of accuracy of the intervening primary and subprimary triangulation. Rept. 1869, app. 6, pp. 105-112.

*See also* Atlantic coast—Baltimore—Chesapeake bay—Eastern oblique arc—Gaithersburg—Kent island—Pamplico-Chesapeake arc—Pocomoke sound—Potomac river—Rockville—Tangier—Transcontinental arc.

**Massachusetts.**

GEOGRAPHIC POSITIONS. Schott, Chas. A. Geographical positions of trigonometrical points in the states of Massachusetts and Rhode Island, 1835 to 1885, including those determined by the Borden survey, 1832 to 1838. Rept. 1885, app. 8, pp. 285-439.

——— Same. 2d ed., revised and enlarged. Rept. 1894, pt. 2, app. 10, pp. 349-615.

PHYSICAL HYDROGRAPHY. Marindin, H. L. Cross sections on the north shores of Nantucket and Martha's Vineyard, Mass. Rept. 1896, pt. 2, app. 8,* pp. 305-346.

TRIANGULATION. Results of the primary triangulation of the coast of New England, from the northeastern boundary to the vicinity of New York. Rept. 1865, app. 21,* pp. 187-203.

*See also* Atlantic coast—Borden survey—Boston harbor—Cambridge—Cape Cod—Chatham—Edgartown harbor—Hudson river—Martha's Vineyard—Merrimac river—Monomoy—Muskeget channel—Nantucket—New England—Plymouth harbor—Provincetown harbor—Vineyard sound—Worcester.

**Massachusetts base.**

Results of the primary triangulation of the coast of New England from the northeastern boundary to the vicinity of New York. Rept. 1865, app. 21,* pp. 187-203.

*See also* Nantucket arc.

**Mathematics and computation.**

*See* Arithmetic—Equations—Formulæ and factors—Functions—Geodesy—Harmonic analysis—Interpolation—Logarithms—Least square method—Motion—N point problem—Projections—Tables—Three point problem—Tide predicting machine—Trajectory of shot.

**Mathiot, George.**

Electrotyping operations of the Coast survey. Rept. 1851, app. 55,* pp. 541-553.

Reports [on electrotype operations and chemiglyphic experiments]. Rept. 1854, app. 31,* pp. 54-57.

Description of [Mathiot's] self-sustaining voltaic battery. Rept. 1854, app. 56,* pp. 193-201.

Time required to produce the maximum intensity of a voltaic current. Rept. 1855, app. 61,* pp. 366-368.

Improved method for taking entire casts from detached plates by electrotype process. Rept. 1855, app. 62,* p. 369.

On a method of measuring galvanic currents of great quantity. Rept. 1855, app. 63, pp. 370-373.

Printing maps from their electrotyped plates. Rept. 1856, app. 62,* pp. 316, 317.

Electrotyping operations. Rept. 1866, app. 20,* pp. 130-138.

**Measures.** *See* Arc measures—Base measures—Standards.

**Mechanical observations.** *See* Automatic methods.

**Mechanics.** *See* Motion.

**Memphis, Tenn.—Levels—Corinth, Miss.**

Schott, C. A. On the results of spirit leveling of precision between Corinth, Miss., and Memphis, Tenn. Rept. 1892, pt. 2, app. 4, pp. 205-224.

**Mendenhall, Thomas Corwin.**

Determinations of gravity with the new half-second pendulums of the Coast and geodetic survey at stations on the Pacific coast, in Alaska, and at the base stations, Washington, D. C., and Hoboken, N. J. Rept. 1891, pt. 2, app. 15, pp. 503-564.

Prefatory note to paper on the variation of latitude at Rockville, Md., as determined from observations made in 1891 and 1892, in cooperation with the International geodetic association. Rept. 1892, pt. 2, app. 1, pp. 1, 2.

Prefatory note to paper on the measurement of the Holton base, Holton, Ripley county, Indiana, and the St. Albans base, Kanawha county, W. Va. Rept. 1892, pt. 2, app. 8, p. 329.

Same. Bull. 25. (1892.)

Fundamental standards of length and mass. Rept. 1893, pt. 2, app. 6, pp. 165-172.

Same. Bull. 26. (1893.)

The United States Coast and geodetic survey. No. 1 in Bull. 29. (1893.)

[Amendment to] General instructions for hydrographic parties, 1894. (1894.)† General instructions for hydrographic parties, 1894. (1895.)†

*See also*, as Superintendent, Reports and other publications, 1889 to 1893, inclusive.

---

* Exhausted. † Not for general distribution.

**Mercurial horizon.** *See* Artificial horizon.

**Mercury, Transit of.**
1878. Colonna, B. A. Transit of Mercury, May 6, 1878, observed at Summit station, Central Pacific railroad. Rept. 1878, app. 6, pp. 81–87.
Schott, C. A. Observations at Washington, D. C., of the transit of Mercury. Rept. 1878, app. 7, pp. 88–91.
1881. Davidson, George, and Gilbert, J. J. Transit of Mercury of November 7, 1881, as observed at Yolo base, California. Rept. 1883, app. 15,* pp. 369–370.
Preston, E. D. Transit of Mercury of May 9, 1881. at Waikiki, Hawaiian islands. Rept. 1891, pt. 2, app. 12, pp. 475–477.
1894. Schott, C. A., Tittmann, O. H., Preston, E. D., Smith, E., Putnam, G. R., Fischer, E. G. Transit of Mercury on November 10, 1894, Coast and geodetic survey office, Washington, D. C. Rept. 1895, pt. 2, app. 4,* pp. 345, 346.

**Meridian arcs.** *See* Arc measures.

**Meridian instrument.**
Davidson, George. New meridian instrument for time, latitude and azimuth. Rept. 1867, app. 8,* pp. 138, 139.
——— Description of the Davidson meridian instrument. Rept. 1879, app. 7, pp. 103–109.
*See also* Instruments.

**Meridian lines.**
Dean, G. W. Establishment of meridian lines at Petersburg, Va., and Raleigh and Wilmington, N. C. Rept. 1854; app. 44,* p. 146.
*See also* Magnetic variations.

**Merrimac river, Mass.**
Mitchell, H. Surveys in the Merrimac river, Massachusetts. Rept. 1867, app. 14,* pp. 170–175.

**Merriman, Mansfield.**
On the determination by least squares of the relation between two variables liable to errors of observation. Rept. 1890, app. 13, pp. 687–690.

**Meteorology.**
Observations upon northers and southeast gales. Notice to mariners 14. (1877.)
Meteorological effects on tides. Rept. 1871, app. 6,* pp. 93–99.
Ferrel, William. Meteorological researches for the use of the Coast pilot. Rept. 1875, app. 20,* pp. 369–412.
——— Meteorological researches for the use of the Coast pilot. Part II. On cyclones, waterspouts, and tornadoes. Rept. 1878, app. 10,* pp. 175–267.
——— Meteorological researches, Part III.—Barometric hypsometry and reduction of the barometer to sea level. Rept. 1881, app. 10, pp. 225–268.
Schott, C. A. Development of Bessel's function for periods frequently occurring in magnetic and meteorological investigations, with examples. Rept. 1862, app. 22,* pp. 232–235.
ALASKA. Bryant, Charles. Meteorological register, St. Paul island, Alaska, 1870–71. Rept. 1871, app. 7,* pp. 100–108.
Davidson, George. Meteorology of Alaska territory. Rept. 1867, app. 18 (H, I, J, K),* pp. 299–317.
LABRADOR. Alexander, Stephen. Expedition to [Aulezavik island] Labrador, to observe the total eclipse of July 18th, 1860. Report on the determination of the magnetic elements by Edward Goodfellow, assistant, with notes by C. A. Schott, assistant. Rept. 1860, app. 21,* pp. 229–275.
PENNSYLVANIA. Bache, A. D. Discussion of the magnetic and meteorological observations made at the Girard college observatory, Philadelphia, 1841–45. Rept. 1859, app. 22,* pp. 278–295.
WYOMING. Cutts, R. D., and Young, Charles A. Astronomical and meteorological observations made at Sherman, Wyo. T. Rept. 1872, app. 8,* pp. 75–172.
*See also* Barometric hypsometry—Climate—Oceanography—Refraction—Sun spots—Winds.

**Meter.**
Barnard, F. A. P., and Tresca, H. Comparison of an iron metre forwarded to France by the Government of the United States of America. Rept. 1867, app. 7,* pp. 134–137.
Schott, C. A. New compensation base apparatus, including the determination of the length of two 5-metre standard bars. Rept. 1882, app. 7, pp. 107–138.
Tittmann, O. H. Historical account of United States Standards of weights and measures; of the National prototypes of the metre and the kilogramme; of their transportation from Paris to Washington; of their official opening and certification and of their deposit in the office of weights and measures. Rept 1890, app. 18, pp. 735–758.
*See also* Current meter—Standards.

**Metric standards.**
Hilgard, J. E. Papers relating to metric standards distributed to the states of the Union under a joint resolution of Congress of July 27, 1866. Sep. pub. (1876.)*

---

* Exhausted.

Schott, C. A., and Tittmann, O. H. Relation between the metric standards of length of the U. S. Coast and geodetic survey and the U. S. Lake survey. Rept. 1889, app. 6,* pp. 179–197.

——— Same. Bull. 17. (1889.)

Tittmann, O. H. On the relation of the yard to the metre. Bull. 9. (1889.)

——— Same. Rept. 1890, app. 16, pp. 715–720.

——— Historical account of United States standards of weights and measures; of the national prototypes of the metre and the kilogramme; of their transportation from Paris to Washington; of their official opening and certification, and of their deposit in the office of weights and measures. Rept. 1890, app. 18, pp. 735–758.

*See also* Kilogram—Meter—Standards—Weights and measures office.

**Metric tables.**

Table showing the height in meters, corresponding to given angles of elevation and distances in meters. Sep. pub. (1900.)

Table for converting customary and metric weights and measures. Sep. pub. (1900.)

Schott, C. A. Height in feet corresponding to a given angle of elevation and a given distance in metres, for use in the construction of contour lines by plane table. Rept. 1860, app. 38,* p. 397.

**Mexico.**

Davidson, George. Magnetic variations off the coasts of California and Mexico, observed by Spanish navigators in the last quarter of the eighteenth century. Rept. 1885, app. 7, pp. 275–284.

Schott, C. A. Transit of Venus, 1769. Results of observations for determining positions occupied in Lower California and at Philadelphia. Rept. 1874, app. 10,* pp. 131–133.

*See* also List of Tide tables in Part I.

**Michigan.**

Ferguson, O. W. Resulting elevations from spirit leveling between Gibraltar, Mich., and Cincinnati, Ohio. Rept. 1899, app. 7, pp. 321–345.

**Micrometric measures.**

Davidson, George. The run of the micrometer. Rept. 1884, app. 8, pp. 377–385.

——— Measure of the irregularity in one turn of the micrometer screw, and the relative value of each turn. Rept. 1892, pt. 2, app. 9, pp. 505–513.

Smith, Edwin. The determination of the mean value of one revolution of a micrometer screw and the progressive and periodic errors of the screw, from observations on a circumpolar star near its elongation. Rept. 1900, app. 8, pp. 701–712.

*See also* Azimuth—Latitude—Horizontal measures—Vertical measures.

**Middle-ground shoal, N. Y.**

Mitchell, H. Middle-ground shoal, New York harbor. Rept. 1872, app. 16,* pp. 257–261.

**Mile.**

Hilgard, J. E. On the length of a nautical mile. Rept. 1881, app. 12, pp. 354–356.

**Mississippi.**

GEOGRAPHIC POSITIONS. Geographical positions determined approximately in West Virginia, Kentucky, Tennessee, Alabama, Mississippi, and Missouri. Rept. 1865, app. 10, p. 137.

LEVELING. Schott, C. A. Heights from spirit levelings of precision between Mobile, Ala., and Carrollton (New Orleans), La. Rept. 1887, app. 9, pp. 185–205.

——— Heights from spirit leveling of precision between Mobile, Ala., and Okolona, Miss. Rept. 1888, app. 10, pp. 409–426.

——— Results of spirit leveling of precision between Okolona, Miss., and Odin, Ill. Rept. 1892, pt. 2, app. 3, pp. 161–203.

*See also* Cat island—Gulf Stream—Gulf coast—Mississippi river.

**Mississippi river.**

CURRENTS. Marindin, H. L. Apparatus for observing currents in connection with the physical survey of the Mississippi river. Rept. 1877, app. 9, pp. 104–107.

GEOLOGY. Little, George. Blue clay of the Mississippi river. Rept. 1880, app. 12, pp. 145–171.

LEVELING. Braid, Andrew. Geodesic leveling on the Mississippi river. Rept. 1880, app. 11, pp. 135–144.

PHYSICAL HYDROGRAPHY. Marindin, H. L. Comparison of surveys of Mississippi river in the vicinity of Cubitt's gap. Rept. 1880, app. 10, pp. 126–134.

Mitchell, Henry. Study of the effect of river bends in the lower Mississippi. Rept. 1882, app. 16, pp. 433–436.

RECONNAISSANCE. Gerdes, F. H. On a reconnaissance from Suwanee river, Florida, to the mouths of the Mississippi. Rept. 1852, app. 12,* pp. 87–94.

——— Reconnaissance of the coast of Louisiana in 1854. Rept. 1854, app. 20,* pp. 28–30.

*See also* South Pass.

**Mississippi sound.**

Gerdes, F. H. Extract from a letter upon the change in the magnetic variation within short distances in the Gulf of Mexico. Rept. 1845, app. 3,* pp. 41–43.

---

*Exhausted.

**Missouri.**

GEOGRAPHIC POSITIONS. Geographical positions approximately determined in West Virginia, Kentucky, Tennessee, Alabama, Mississippi and Missouri. Rept. 1865, app. 10,* p. 137.

LEVELING. Schott, C. A. Heights from geodetic leveling between St. Louis and Jefferson City, Mo., 1882–1888. Rept. 1893, pt. 2, app. 2, pp. 19–36.

——— Resulting heights from spirit leveling between Jefferson City, Mo., and Holiday, Kans. Rept. 1896, pt. 2, app. 5, pp. 265–284.

*See also* Mississippi river—Transcontinental arc—St. Louis.

**Mitchel, Ormsley McKnight.**

Mechanical record of astronomical observations. Rept. 1849, app. 5,* pp. 72–78.

A new method of recording differences of north polar distances, or declination, by electro-magnetism. Rept. 1851, app. 9,* pp. 137–145.

**Mitchell, Henry.**

Tidal observations on the south shore of Massachusetts and in Nantucket and Vineyard sounds. Rept. 1854, app. 29,* pp. 35–37.

Description of tide-gauge used at stations on the open seacoast and in situations exposed to strong currents. Rept. 1854, app. 53,* pp. 190, 191.

Tidal observations in Nantucket sound. Rept. 1855, app. 33,* pp. 222, 223.

Interference tides of Nantucket and Martha's Vineyard sounds. Rept. 1856, app. 37,* pp. 261–263.

Tides and currents of New York harbor and its dependencies. Rept. 1856, app. 39,* pp. 264–266.

Tides and currents in Nantucket and Martha's Vineyard sounds and in East river at Hell Gate with remarks on the revision of levelings on Hudson river. Rept. 1857, app. 35,* pp. 350–354.

Tide gauge for deep water. Rept. 1857, app. 50,* pp. 403, 404.

Currents in the East river at Hell Gate and Throg's Neck, the sub-currents of New York bay and harbor and levelings on the banks of the Hudson river. Rept. 1858, app. 28,* pp. 204–207.

Physical survey of New York harbor and the coast of Long island. Rept. 1859, app. 26,* pp. 311–317.

Implements devised for collecting specimens of bottom in alluvial harbors. Rept. 1860, app. 39,* p. 398.

Soundings across the Florida straits. Rept. 1866, app. 5,* pp. 35–44.

Preliminary report on the interference tides of Hell Gate, with directions for reducing the soundings. Rept. 1866, app. 6,* pp. 44–46.

Tides and currents of Hell Gate, N. Y. Rept. 1867, app. 13,* pp. 158–169.

Surveys in the Merrimack river, Massachusetts. Rept. 1867, app. 14,* pp. 170–175.

Report on soundings made to develop the character of the Strait of Florida between Key West and Havana. Rept. 1867, app. 15,* pp. 176–179.

Notes on Gulf Stream observations. Rept. 1868, app. 11,* pp. 166, 167.

Reclamation of tide lands and its relation to navigation. Rept. 1869, app. 5, pp. 75–104.

(And H. L. Whiting.) Reports concerning Martha's Vineyard and Nantucket. Rept. 1869, app. 15,* pp. 236–259.

Method of determining elevations along the course of a tidal river without the aid of a leveling instrument. Rept. 1870, app. 11,* pp. 98, 99.

On the probable effect of extended piers in modifying the channel facilities of San Francisco bay near Yerba Buena island. Rept. 1870, app. 18,* pp. 180, 181.

Harbor of New York, 1873. Rept. 1871, app. 8,* pp. 109–133.

Nauset beach and Monomoy peninsula. Rept. 1871, app. 9,* pp. 134–143.

Location of harbor lines. Rept. 1871, app. 10,* pp. 144–153.

Middle-ground shoal, New York harbor. Rept. 1872, app. 16,* pp. 257–261.

Physical survey of Portland harbor. Rept. 1873, app. 8,* pp. 94–102.

Changes in the neighborhood of Chatham and Monomoy. Rept. 1873, app. 9,* pp. 103–107.

Changes in the submerged contours off Sandy Hook. Rept. 1873, app. 10,* pp. 108–110.

Terminal points of the proposed canals through Nicaragua and the Isthmus of Darien. Rept. 1874, app. 12, pp. 135–147.

Recent observations at South pass bar, Mississippi river. Rept. 1875, app. 11,* pp. 189–193.

Changes in the harbor of Plymouth, Mass. Rept. 1876, app. 9*, pp. 143–146.

Physical survey of New York harbor. Rept. 1876, app. 10,* pp. 147–185.

Location of a quay or pier line in the vicinity of the United States Navy-yard at New York. Rept. 1876, app. 11,* pp. 186–189.

Characteristics of South pass, Mississippi river. Rept. 1876, app. 12, p. 190, 191.

Alleged changes in the relative elevations of land and sea. Rept. 1877, app. 8,* pp. 98–103.

Physical survey of the Delaware river at Philadelphia. Rept. 1878, app. 9, pp. 121–173.

Physical hydrography of the Gulf of Maine. Rept. 1879, app. 10, pp. 175–190.

Addendum to a report on a physical survey of the Delaware river. Rept. 1879, app. 13, pp. 199, 200.

New rule for currents in Delaware bay and river. Rept. 1881, app. 18, pp. 464–469.

Study of the effect of river bends in the lower Mississippi. Rept. 1882, app. 16, pp. 433–436.

Estuary of the Delaware. Rept. 1883, app. 8, p. 239–245.

A plea for a light on St. Georges bank. Rept. 1885, app. 11, pp. 483–485.

---

*Exhausted.

A report on Monomoy and its shoals. Rept. 1886, app. 8, pp. 255–261.
A report on the delta of the Delaware. Rept. 1886, app. 10, pp. 267–279.
Circulation of the sea through New York harbor. Rept. 1886, app. 13, pp. 409–432.
On the movements of the sands at the eastern entrance to Vineyard sound. Rept. 1887, app. 6, pp. 159–163.
Addendum to appendix on the estuary of the Delaware. Rept. 1887, app. 13, pp. 269–273.
Report on the results of the physical surveys of New York harbor. Rept. 1887, app. 15, pp. 301–311.

**Mobile, Ala.—Levels—Carrollton (New Orleans), La.**
Schott, C. A. Heights from spirit levelings of precision between Mobile, Ala., and Carrollton (New Orleans), La. Rept. 1887, app. 9, pp. 185–205.

**Mobile, Ala.—Levels—Okolona, Miss.**
Schott, C. A. Heights from spirit leveling of precision between Mobile, Ala., and Okolona, Miss. Rept. 1888, app. 10, pp. 409–426.

**Mobile bay entrance.**
Patterson, C. P. Letter relating to the tides at the entrance of Mobile bay. Rept. 1846, app. 8,* pp. 68–70.

**Model.** *See* Relief model.

**Moisture.**
Effect of atmospheric moisture on the dimensions of different kinds of drawing paper. Rept. 1862, app. 27,* p. 255.

**Monomoy, Mass.**
Mitchell, H. Nauset beach and Monomoy peninsula. Rept. 1871, app. 9,* pp. 134–143.
——— Changes in the neighborhood of Chatham and Monomoy. Rept. 1873, app. 9,* pp. 103–107.
——— A report on Monomoy and its shoals. Rept. 1886, app. 8, pp. 255–261.
——— On the movements of the sands at the eastern entrance to Vineyard sound. Rept. 1887, app. 6, pp. 159–163.
*See also* Cape Cod—Nantucket sound.

**Montgomery, Ala.—Longitude—Wilmington, N. C.**
Gould, B. A. Observations for difference of longitude between Wilmington, N. C., and Montgomery, Ala. Rept. 1856, app. 20,* pp. 163–166.

**Moon.**
Bache, A. D. Investigation of the influence of the moon on the magnetic declination. (Part III in Discussion of magnetic and meteorological observations Girard college observatory, Philadelphia, in 1840–45.) Rept. 1860, app. 24,* pp. 312–324.
Ferrel, William. On the moon's mass, as deduced from a discussion of the tides of Boston harbor. Rept. 1870, app. 20,* pp. 190–199.
Peirce, Benjamin. Upon the tables of the moon used in the reduction of the Pleiades. Rept. 1862, app. 13,* pp. 157, 158.
——— Method of determining the corrections of lunar semidiameter, mean place, ellipticity of orbit, longitude of perihelion, coefficient of annual parallax, and longitude of Europe and America from the occultation of the Pleiades. Rept. 1865, app. 13,* pp. 146–149.
Peters, C. H. F. On substituting a lunar spot instead of the moon's limb in transits for determining the difference of longitude. Rept. 1856, app. 25,* pp. 198–203.
*See also* Lunar distances—Lunar tables—Magnetic variations—Occultations—Tides.

**Moon culminations.**
Method of computing longitudes from moon culminations. Rept. 1858, app. 21,* pp. 186–189.
Bond, W. C. On moon culminations observed by the "American method" with remarks on the performance of the spring governor. Rept. 1853, app. 32,* pp. 84–86.
——— Moon culminations observed by the "American method." Rept. 1854, app. 37,* p. 120.
——— Moon culminations observed at Cambridge and the chronometric expedition for difference of longitude between Cambridge, Mass., and Liverpool, Eng. Rept. 1855, app. 43,* pp. 275, 276.
——— On moon culminations and results of the chronometer expeditions between Cambridge and Liverpool for difference of longitude. Rept. 1856, app. 22,* p. 181.
——— Moon culminations and other phenomena. Rept. 1857, app. 28,* pp. 310, 311.
Kendall, E. O. Moon culminations observed at High school observatory, Philadelphia. Rept. 1854, app. 38,* p. 120.
Peirce, Benjamin. On longitudes from moon culminations. Rept. 1853, app. 31,* p. 84.
——— Longitude by moon culminations. Rept. 1854, app. 36,* pp. 108–120.
Peters, C. H. F. On substituting a lunar spot instead of the moon's limb in transits for determining the difference of longitude. Rept. 1856, app. 25,* pp. 198–203.
Schott, C. A. Approximate times of culminations and elongations and of the azimuths at elongation of Polaris for the years between 1889 and 1910. Bull. 14. (1890.)
——— Same. Rept. 1891, pt. 2, app. 1, pp. 7–13.
Walker, S. C. Abstract of reports on longitudes. Rept. 1851, app. 26,* pp. 480, 481.

---

*Exhausted.

**Moore, Edwin King.**
ALASKA. Predicted times of slack water at Seymour narrows, Discovery passage, B. C., and at Sergius narrows, Peril strait, Alaska, from May to December, 1899. Bull. 39. (1899.)

**Moser, Jefferson Francis.**
ALASKA. Hydrographic notes and sailing directions relating to portions of Alaska from Dixon entrance to Yakutat bay, including reconnaissance surveys of Cordova bay, Bucarelli bay, and Red Fish bay. Bull. 37. (1899.)
Hydrographic notes, sailing directions, and charts of surveys relating to the vicinity of Prince William sound, Cooks inlet, Kadiak island, and route from Unalaska to Chignik, through Unimak pass and inside the islands. Bull. 38. (1899.)

**Mosman, Alonzo T.**
On the measurement of the Holton base, Holton, Ripley county, Ind., and the St. Albans base, Kanawha county, W. Va. Extracts from the records and from the reports. Rept. 1892, pt. 2, app. 8, pp. 330–333.

**Motion.**
Craig, Thos. General properties of the equations of steady motion. Sep. pub. (1881.)*
Trowbridge, W. P. Investigation of the laws of motion governing the descent of the weight and line in deep sea sounding. Rept. 1858, app. 37,* pp. 228–246.

**Mt. Cook, Alas.**
Dall, W. H. Report on Mt. St. Elias, Mt. Fairweather and some of the adjacent mountains. Rept. 1875, app. 10,* pp. 157–188.

**Mt. Crillon, Alas.**
Dall, W. H. Report on Mt. St. Elias, Mt. Fairweather and some of the adjacent mountains. Rept. 1875, app. 10,* pp. 157–188.

**Mt. Fairweather, Alas.**
Dall, W. H. Report on Mt. St. Elias, Mt. Fairweather and some of the adjacent mountains. Rept. 1875, app. 10,* pp. 157–188.

**Mt. Hamilton, Cal.**
Schott, C. A. Telegraphic determination of the longitude of a station on Mount Hamilton, Cal., and its trigonometrical connection with the Lick observatory. Rept. 1889, app. 8, pp. 209–212.
——— Same. Bull. 13. (1889.)

**Mt. St. Elias, Alas.**
Dall, W. H. Report on Mt. St. Elias, Mt. Fairweather and some of the adjacent mountains. Rept. 1875, app. 10,* pp. 157–188.

**Mt. Santa Lucia, Cal.**
Davidson, George. The total solar eclipse of January 11, 1880, observed at Mount Sarta Lucia, Cal. Rept. 1882, app. 20, pp. 463–468.

**Mt. Vancouver, Alas.**
Dall, W. H. Report on Mt. St. Elias, Mt. Fairweather and some of the adjacent mountains. Rept. 1875, app. 10,* pp. 157–188.

**Muck Prairie, Wash.** *See* Fort Steilacoom.

**Muir glacier, Alas.**
Reid, H. F. Report on an expedition to Muir glacier, Alaska, with determinations of latitude and the magnetic elements at Camp Muir, Glacier bay. Rept. 1891, pt. 2, app. 14, pp. 487–501.

**Murray, Alexander.**
Labrador eclipse expedition and incidental results bearing on the hydrography of the coast of Labrador. Rept. 1860, app. 41,* pp. 399–402.

**Muskeget channel.**
Schott, C. A. Currents in Muskeget channel and off Martha's Vineyard. Rept. 1854, app. 49,* pp. 166–168.

**N-point problem.**
Schott, C. A. The problem of determining a position by angles observed upon a number of given stations. Solution of Gauss, with example. Rept. 1864, app. 13,* pp. 116–119.

**Nagasaki, Japan.**
Davidson, George. Transit of Venus, Japan [1874]. Rept. 1875, app. 13,* pp. 222–230.

**Nantucket arc.**
Schott, C. A. Measures of arc of meridian of 30° 23′ between Nantucket [Mass.] and Farmington, Me. Rept. 1868, app. 9,* pp. 147–153.
——— The Pamplico-Chesapeake arc of the meridian and its combination with the Nantucket and the Peruvian arcs for a determination of the figure of the earth from American measures. Rept. 1877, app. 6, pp. 84–95.

---

*Exhausted.

**Nantucket harbor, Mass.**
Marindin, H. L. Changes in the depths of the bar at the entrance to Nantucket inner harbor, Mass., between 1888 and 1893. Rept. 1895, pt. 2, app. 5, pp. 347-354.

**Nantucket island, Mass.**
Marindin, H. L. Changes in the ocean shore lines of Nantucket island, Mass., from a comparison of surveys 1846 to 1887 and in 1891. Rept. 1892, pt. 2, app. 6, pp. 243-252.
——— Cross sections on the north shores of Nantucket and Martha's Vineyard, Mass. Rept. 1896, pt. 2, app. 8,* pp. 305-346.
Whiting, H. L., and Mitchell, H. Reports concerning Martha's Vineyard and Nantucket. Rept. 1869, app. 15,* pp. 236-259.
*See also* Muskeget channel.

**Nantucket sound, Mass.**
Mitchell, H. Tidal observatious on the south shore of Massachusetts and in Nantucket and Vineyard sounds. Rept. 1854, app. 29,* pp. 35-37.
——— Tidal observations in Nantucket sound. Rept. 1855, app. 33,* pp. 222, 223.
——— Interference tides of Nantucket and Martha's Vineyard sounds. Rept. 1856, app. 37,* pp. 261-263.
——— Tides and currents in Nantucket and Martha's Vineyard sounds and in East river at Hell Gate with remarks on the revision of levelings on Hudson river. Rept. 1857, app. 35,* pp. 350-354.
Schott, C. A. On the currents of Nantucket shoals. Rept. 1854, app. 48,* pp. 161-166.
——— Currents in Muskeget channel and off Martha's Vineyard. Rept. 1854, app. 49,* pp. 166-168.
Whiting, H. L., and Mitchell, H. Reports concerning Martha's Vineyard and Nantucket. Rept. 1869, app. 15,* pp. 236-259.
*See also* Cape Cod—Martha's Vineyard—Muskeget channel—Vineyard sound.

**Nauset beach, Mass.**
Mitchell, H. Nauset beach and Monomoy peninsula. Rept. 1871, app. 9,* pp. 134-143.

**Nautical affairs.** *See* Bibb (steamer)—Blake (steamer)—Engines—Hassler (steamer)—Hetzel (steamer)—Hydraulic engineering—Hydrography—Mile—Terrestrial magnetism.

**Naval observatory.**
Preston, E. D. Establishment of the United States Naval observatory circle, and the determination of the geographical position of the center of the clock room. Rept. 1896, pt. 2, app. 6,* pp. 285-291.

**Navigation.** *See* Hydrographic surveys—Coast pilot—Currents—Light-houses—Magnetic declination—Oceanography—Physical hydrography—Sounding—Tides.

**Nebraska.**
BASE MEASURES. Baldwin, A. L. On the measurement of nine bases along the ninety-eighth meridian. Rept. 1901, app. 3, pp. 229-302.
LEVELING. Tilton, B. E. Resulting elevations from spirit leveling between Abilene, Kans. and Norfolk, Neb., 1899. Rept. 1899, app. 6, pp. 299-320.
TRIANGULATION. Hayford, John F. Triangulation northward along the ninety-eighth meridian in Kansas and Nebraska. Rept. 1901, app. 6, pp. 357-423.

**Necrology.** *See* Blair, Henry W.—Patterson, C. P.

**Nevada.**
Sinclair, C. H. The oblique boundary line between California and Nevada. Rept. 1900, app. 3, pp. 255-484.
*See also* Lehman's ranch—Transcontinental arc.

**New England.**
Results of the primary triangulation of the coast of New England, from the northeastern boundary to the vicinity of New York. Rept. 1865, app. 21,* pp. 187-203.
ARC MEASURES. Schott, C. A. Measures of arc of meridian of 3° 23′ between Nantucket [Mass.] and Farmington, Me. Rept. 1868, app. 9,* pp. 147-153.
CURRENTS. Libby, William, jr. Relations of cold and warm ocean currents off the New England coast, by the U. S. Fish commission, with the co-operation of the U. S. Coast and geodetic survey. Rept. 1891, pt. 2, app. 7,* pp. 279-281.
TERRESTRIAL MAGNETISM. Schott, C. A. Magnetic declination, dip, and intensity in 1859. Rept. 1859, app. 23,* p. 296.
TIDES. Ferrel, William. Maxima and minima of tides on the coast of New England for 1873. Rept. 1872, app. 7,* pp. 73, 74.
*See also* Atlantic Coast—Connecticut—Lake Champlain—Maine—Massachusetts—New Hampshire—Rhode Island.

**New Hampshire.** *See* Gunstock mountain—New England.

---

* Exhausted.

**New Jersey.**

LEVELING. Cutts, R. D. Leveling operations between Keyport, on Raritan bay, and Gloucester, on the Delaware river, to determine the heights above mean tide of the primary stations Beacon hill, Disboro, Stony hill, Mount Holly, and Pine hill. Rept. 1870, app. 7,* pp. 75, 76.

——— Same, revised. Rept. 1871, app. 12,* pp. 171–175.

——— Barometrical observations made in connection with the line of spirit leveling, from Raritan bay to the Delaware river to determine the heights above mean tide of primary stations. Rept. 1870, app. 8,* pp. 77–89.

Schott, Charles A. Report on the results of spirit leveling of precision about New York bay and vicinity in 1886 and 1887. Rept. 1887, app. 14, pp. 275–300.

TERRESTRIAL MAGNETISM. Schott, C. A. Magnetic declination, dip and horizontal intensity [determined in 1860] on Cape Cod peninsula, Long island and New Jersey. Rept. 1860, app. 29,* p. 352.

TOPOGRAPHY. Harrison, A. M. Topography on the coast of New Jersey, including Sandy Hook. Rept. 1855, app. 23,* pp. 164, 165.

*See also* Atlantic coast—Delaware river—Eastern oblique arc—Hoboken—New York harbor—Sandy Hook.

**New Orleans, La.** *See* Cotton centennial exposition.

**New Orleans, La.—Levels—Arkansas City, Ark.**

Schott, C. A. Heights from spirit leveling of precision between New Orleans, La., and Arkansas City, Ark. Rept. 1888, app. 11, p. 427–453.

**New Orleans (Carrollton), La.—Levels—Mobile, Ala.**

Schott, C. A. Heights from spirit levelings of precision between Mobile, Ala., and Carrollton (New Orleans), La. Rept. 1887, app. 9, pp. 185–205.

**New Orleans, La.—Longitude—Calais, Me.**

Gould, B. A. Longitude from observations by telegraph between Calais, Me., and New Orleans, La. Rept. 1862, app. 14,* pp. 158–160.

**New South Wales.** *See* Sydney.

**New York.**

LEVELING. Mitchell, H. Currents in the East river at Hell Gate and Throg's Neck, the subcurrents of New York bay and harbor and levelings on the banks of the Hudson river. Rept. 1858, app. 28,* pp. 204–207.

TERRESTRIAL MAGNETISM. Schott, C. A. Results for magnetic declination, dip, and horizontal intensity in Pennsylvania, in the District of Columbia, and in New York. Rept. 1862, app. 18,* p. 212.

TRIANGULATION. Results of the primary triangulation of the coast of New England, from the northeastern boundary to the vicinity of New York. Rept. 1865, app. 21,* pp. 187–203.

Schott, C. A. Connection at Lake Ontario of the primary triangulation of the Coast and geodetic survey with that of the Lake survey. Rept. 1884, app. 9, pp. 387–390.

*See also* Albany—Atlantic coast—Buffalo—Hudson river—Lake Champlain—Long Island—Long Island sound—New York city—New York harbor.

**New York bay.** *See* New York harbor.

**New York city.**

Gerdes, F. H. Topographical survey of Manhattan island. Rept. 1855, app. 21,* pp. 162, 163.

Smith, Edwin. Determinations of gravity at the Polytechnic institute, Worcester, Mass., and at Columbia university, New York city, with pendulum apparatus B. Rept. 1899, app. 4, pp. 271–282.

*See also* Hudson river.

**New York city—Longitude—Albany, N. Y.**

Gould, B. A. Determination of longitude at Albany, N. Y., by the telegraphic method. Rept. 1861, app. 18, pp. 221–232.

**New York harbor and approaches.**

Resurvey of New York bay and harbor and dependencies for the Commissioners on harbor encroachments. Rept. 1855, app. 24,* pp. 165–171.

Boschke, A. [Comparative] maps of New York harbor. Rept. 1856, app. 48,* pp. 281, 282.

——— Report on the drawing of maps of New York harbor, made for the Commissioners on harbor encroachments. Rept. 1857, app. 38,* pp. 373, 374.

Cutts, R. D. Barometrical observations made in connection with the line of spirit leveling, from Raritan bay to the Delaware river to determine the heights above mean tide of primary stations. Rept. 1870, app. 8,* pp. 77–89.

CURRENTS. Colonna, B. A. Currents of New York bay and harbor. Bull. 8. (1889.)

Mitchell, H. Currents in the East river at Hell Gate and Throg's Neck, the sub-currents of New York bay and harbor and levelings on the banks of the Hudson river. Rept. 1858, app. 28,* pp. 204–207.

---

* Exhausted.

CURRENTS. Mitchell, H. Middle-ground shoal, New York harbor. Rept. 1872, app. 16,* pp. 257-261.

——— Circulation of the sea through New York harbor. Rept. 1886, app. 13, pp. 409-432.

HYDROGRAPHY. Gibbs, Wolcott. Analysis of the water of New York harbor. Rept. 1856, app. 63,* pp. 317, 318.

LEVELING. Schott, C. A. Report of the results of spirit leveling of precision about New York bay and vicinity in 1886 and 1887. Rept. 1887, app. 14, pp. 275-300.

PHYSICAL HYDROGRAPHY. Report to Commissioners on the preservation of New York harbor from encroachment, by the Advisory council on the comparative map of New York bay and harbor, prepared by the Coast survey, 1857. Rept. 1857, app. 37,* pp. 358-373.

Lindenkohl, A. Geology of the sea bottom in the approaches to New York bay. Rept. 1884, app. 13,* pp. 435-438.

Mitchell, H. Physical survey of New York harbor and the coast of Long Island, with descriptions of apparatus for observing currents. Rept. 1859, app. 26,* pp. 311-317.

——— Harbor of New York, 1873. Rept. 1871, app. 8*, pp. 109-133.

——— Middle-ground shoal, New York harbor. Rept. 1872, app. 16,* pp. 257-261.

——— Physical survey of New York harbor. Rept. 1876, app. 10,* pp. 147-185.

——— Location of a quay or pier line in the vicinity of the United States Navy-yard at New York. Rept. 1876, app. 11, pp. 186-189.

——— Report on the results of the physical surveys of New York harbor. Rept. 1887, app. 15, pp. 301-311.

PILOTAGE. Changes in the pilotage laws of the port of New York. Notice to mariners 53. (1884.)

TIDES. Bache, A. D. Tidal currents of New York harbor near Sandy Hook. Rept. 1858, app. 27,* pp. 197-203.

Ferrel, William. Discussion of tides in New York harbor. Rept. 1875, app. 12, pp. 194-221.

——— On the harmonic analysis of the tides at Governor's island, New York harbor. Rept. 1885, app. 13, pp. 489-493.

Marindin, H. L. Tide levels and flow of currents in New York bay and harbor. Rept. 1888, app. 9, pp. 405-408.

——— Same, abstract. Bull. 3. (1888.)

Mitchell, H. Tides and tidal currents of New York harbor and its dependencies [Newark bay and the Kills] and at Sandy Hook. Rept. 1856, app. 39,* pp. 264-266.

——— Circulation of the sea through New York harbor. Rept. 1886, app. 13, pp. 409-432.

——— Report on the results of the physical surveys of New York harbor. Rept. 1887, app. 15, pp. 301-311.

Schott, C. A. Tidal currents of Long Island sound and approaches. Rept. 1854, app. 50,* pp. 168-179.

*See also* Hell Gate—Hudson river—Long Island—Sandy Hook.

**New Zealand.** *See* Auckland.

**Newark bay, N. J.** *See* New York harbor.

**Nicaragua canal.**

Mitchell, H. Terminal points of the proposed canals through Nicaragua and the Isthmus of Darien. Rept. 1874, app. 12, pp. 135-147.

Sonnenstern, Maximilian von. Report on the Nicaragua route for an interoceanic ship-canal, with a review of other proposed routes. Sep. pub. (1874.)*

*See also* Panama.

**Nicollet, J. N.**

Results of magnetic observations made in the United States by, between 1832 and 1836. Rept. 1864, app. 19,* pp. 207-210.

**Ninety-eighth meridian arc.**

Baldwin, A. L. On the measurement of nine base lines along the ninety-eighth meridian. Rept. 1901, app. 3, pp. 229-302.

Hayford, J. F. Triangulation northward along the ninety-eighth meridian in Kansas and Nebraska. Rept. 1901, app. 6, pp. 357-423.

**Noddy.**

Peirce, C. S. On the use of the noddy for measuring the amplitude of swaying in a pendulum support. Rept. 1884, app. 15, pp. 475-482.

——— On the influence of a noddy on the period of a pendulum. Rept. 1885, app. 16, pp. 509, 510.

**Norfolk, Neb.—Levels—Abilene, Kans.**

Tilton, B. E. Resulting elevations from spirit leveling between Abilene, Kans., and Norfolk, Neb., from observations by A. L. Baldwin, assistant, and B. E. Tilton, aid, between May 8 and October 17, 1899. Rept. 1899, app. 6, pp. 299-320.

**Normal equations.**

Schott, C. A. Solution of normal equations by indirect elimination. Rept. 1855, app. 40,* pp. 255-264.

**North America.** *See* Alaska—America—Canada—Gulf of Maine—Gulf Stream—Mexico—United States.

---

* Exhausted.

**North America, Bay of.** *See* Atlantic ocean—Gulf of Maine.

**North and south lines.** *See* Meridian lines.

**North Carolina.**

OYSTER BEDS. Winslow, Francis. Report on the sounds and estuaries of North Carolina with reference to oyster culture. Bull. 10. (1889.)

TERRESTRIAL MAGNETISM. Baylor, James B., and Hazard, Daniel L. General report on the magnetic survey of North Carolina, with a brief historical sketch of the fundamental phenomena of the earth's magnetism. Rept. 1899, app. 9, pp. 887–938.

Hazard, D. L. Magnetic survey of North Carolina. Values of the magnetic declination at the county seats from 1750 to 1910. Bull. 41. (1901.)

*See also* Albemarle sound—Beaufort harbor—Bodies island base—Cape Fear river entrance—Eastern oblique arc—Gulf Stream—Pamplico-Chesapeake arc—Raleigh—Wilmington.

**North polar distance.** *See* Declination.

**North river.** *See* New York harbor.

**Northwest coast of America.**

Davidson, George. An examination of some of the early voyages of discovery and exploration on the northwest coast of America, from 1539 to 1603. Rept. 1886, app. 7, pp. 155–253.

**Northwest territory.** *See* Canada.

**Nova Scotia.** *See* Halifax.

**Notices to mariners.** *See* List of Notices to mariners and list of Coast pilots in Part I.

**Oahu.** *See* Honolulu.

**Obituary.** *See* Blair, Henry W.—Patterson, C. P

**Oblique arc.** *See* Eastern oblique arc.

**Observatories.** *See* Girard college observatory—Lick observatory—Los Angeles—Madison (Wis.)—Magnetic observatories—Naval observatory.

**Occultations.**

Bond, W. C. Moon culminations and other phenomena. Rept. 1857, app. 28,* pp. 310, 311.

Davidson, G. Occultations of *α* Scorpii and of the planet Mars at Point Hudson, Port Townshend, Washington territory, April and May, 1856. Rept. 1856, app. 26,* pp. 203–208.

Peirce, Benjamin. Method of determining longitudes by occultations of the Pleiades. Rept. 1855, app. 42,* pp. 267–274.

——— On the determination of longitude by occultations of the Pleiades. Rept. 1856, app. 24,* pp. 191–197.

——— Determination of longitudes by occultations of the Pleiades and solar eclipses. Rept. 1857, app. 29,* pp. 311–314.

——— Determination of longitudes by occultations of the Pleiades. Rept. 1861, app. 17, pp. 196–221.

——— On the computations of the occultations of the Pleiades for longitude. Rept. 1862, app. 12,* pp. 155, 156.

——— Reports upon the occultations of the Pleiades in 1841–42. Rept. 1863, app. 17,* pp. 146–154.

——— On computations for longitudes by occultations of the Pleiades. Rept. 1864, app. 11,* p. 114.

——— Report on the progress of determining longitude from occultations of the Pleiades (continued from previous reports). Rept. 1865, app. 12,* pp. 138–146.

Walker, S. C. Abstract of reports on longitudes. Rept. 1851, app. 26,* pp. 480, 481.

**Ocean depths.**

Bache, A. D. Notice of earthquake waves on the western coast of the United States, December 23 and 25, 1854 [and derived mean depth of Pacific ocean]. Rept. 1855, app. 51,* pp. 342–346.

——— Same. Rept. 1862, app. 24,* pp. 238–241.

Hilgard, J. E. Description of a model of the depths of the sea in the Bay of North America and in the Gulf of Mexico. Rept. 1884, app. 17, pp. 619–621.

Trowbridge, W. P. Apparatus devised by W. P. Trowbridge and method of applying it in determining ocean depths and obtaining specimens of bottom. Rept. 1859, app. 34,* pp. 359–364.

*See also* Depths—Dredging—Sea bottom—Sea water—Sounding.

**Ocean temperatures.**

Table showing temperatures at depths below 700 fathoms, taken by Lieutenants Commanding C. H. Davis in 1845, George M. Bache in 1846, and S. P. Lee in 1847. Rept. 1847, app. 11,* p. 75.

Dall, W. H. Geographical and hydrographical explorations on the coast of Alaska. Rept. 1873, app. 11,* pp. 111–122.

---

*Exhausted.

Dall, W. H. Report on the currents and temperatures of Bering sea and adjacent waters. Rept. 1880, app. 16,* pp. 297–340.

GULF STREAM. Bache, A. D. On the distribution of temperatures in and near the Gulf Stream. Rept. 1854, app. 47,* pp. 156–161.

——— Gulf stream explorations. Third memoir: Distribution of temperature in the water of the Florida channel and straits. Rept. 1859, app. 25,* pp. 306–310.

PACIFIC. Lindenkohl, A. Problems of physiography concerning salinity and temperature of the Pacific ocean. Rept. 1898, app. 9, pp. 463–473.

*See also* Currents.

**Oceanica.** *See* Pacific ocean.

**Oceanography.**

List of publications relating to the deep-sea investigations carried on in the vicinity of the coasts of the United States under the auspices of the Coast survey. Rept. 1876, app. 23,* pp. 407–409.

*See also* Currents—Depth recorder—Dredging—Hydrographic surveys—Ocean depths—Physical hydrography—Sea bottom—Sea water—Sounding—Tides.

**Oceans.** *See* Arctic ocean—Atlantic ocean—Bering sea—Gulf of Maine—Gulf of Mexico—Gulf Stream—Pacific ocean.

**Odin, Ill.—Levels—Okolona, Miss.**

Schott, C. A. Results of spirit leveling of precision between Okolona, Miss., and Odin, Ill. Rept. 1892, pt. 2, app. 3, pp. 161–203.

**Ogden, Herbert Gouverneur.**

Chart publications. No. 11 in Bull. 29. (1893.)

**Ohio.**

Ferguson, O. W. Resulting elevations from spirit leveling between Gibraltar, Mich., and Cincinnati, Ohio. Rept. 1899, app. 7, pp. 321–345.

*See also* Transcontinental arc.

**Okhotsk sea.**

Lindenkohl, A. Problems of physiography, concerning salinity and temperature of the Pacific ocean. Rept. 1898, app. 9, pp. 463–473.

**Oklahoma.** *See* El Reno base.

**Okolona, Miss.—Levels—Mobile, Ala.**

Schott, C. A. Heights from spirit leveling of precision between Mobile, Ala., and Okolona, Miss. Rept. 1888, app. 10, pp. 409–426.

**Okolona, Miss.—Levels—Odin, Ill.**

Schott, C. A. Results of spirit leveling of precision between Okolona, Miss., and Odin, Ill. Rept. 1892, pt. 2, app. 3, pp. 161–203.

**Old Point Comfort, Va.—Levels—Richmond, Va.**

Schott, C. A. Resulting heights from spirit leveling between Old Point Comfort and Richmond, Va., 1884, 1891 and 1892. Rept. 1896, pt. 2, app. 2, pp. 237–246.

**Olney base, Ill.** *See* Lake survey.

**Ontario.** *See* Lake Ontario.

**Ooglaamie, Point Barrow, Alas.**

Schott, C. A. Magnetic observations under direction of the Survey, in co-operation with the U. S. Signal office, at the U. S. Polar station, Ooglaamie, Point Barrow, Alaska. Rept. 1883, app. 13, pp. 323–365.

**Oregon.**

RECONNAISSANCE. McArthur, W. P. Report accompanying a reconnaissance chart of the western coast of the United States, from Monterey, Cal., to the Columbia river, Oregon. Rept. 1850, app. 31,* pp. 119–121.

TIDES. Bache, A. D. Notice of earthquake waves on the western coast of the United States, December 23 and 25, 1854. Rept. 1855, app. 51,* pp. 342–346.

——— Same. Rept. 1862, app. 24,* pp. 238–241.

*See also* Astoria—Columbia river—Coos bay—Northwest coast—Pacific coast.

**Organization.** *See* Coast and geodetic survey.

**Oscillation.** *See* Pendulum.

**Osculating spheroid.**

Schott, C. A. The Eastern oblique arc of the United States and osculating spheroid. Sp. pub. no. 7. (1902.)

---

* Exhausted.

### Oyster beds.

CHESAPEAKE BAY. Winslow, Francis. Report on the oyster beds of the James river, Virginia, and of Tangier and Pocomoke sounds, Maryland and Virginia. Rept. 1881, app. 11, pp. 269–353.

GEORGIA. Drake, J. C. On the sounds and estuaries of Georgia with reference to oyster culture. Bull. 19. (1891.)

NORTH CAROLINA. Winslow, Francis. Report on the sounds and estuaries of North Carolina with reference to oyster culture. Bull. 10. (1889.)

*See also* Depths—Hydrographic surveys—Hydrometer—Sounding.

### Pacific coast of the United States.

COAST PILOT. Descriptive report of localities on the western coast, from the north entrance to Rosario strait, Washington territory, to the southern boundary of California. Rept. 1855, app. 26,* pp. 176–185.

Bache, A. D. Sailing directions to accompany the new chart of the western coast of the United States. Sep. pub. (1850.)

——— Notices of the western coast of the United States. Sep. pub. (1851.)

Davidson, George. Directory for the Pacific coast of the United States [including geographical positions]. Rept. 1858, app. 44,* pp. 297–458.

——— Same. Ed. 2. Rept. 1862, app. 39,* pp. 268–430.

*See also* List of Coast pilots—List of Notices to mariners in Part I.

EARTHQUAKE WAVES. Bache, A. D. Notice of earthquake waves on the western coast of the United States, December 23 and 25, 1854. Rept. 1855, app. 51,* pp. 342–346.

——— Same. Rept. 1862, app. 24,* pp. 238–241.

GEOGRAPHICAL POSITIONS. Additional geographical positions determined astronomically by the Coast survey on and near the western coast. Rept. 1874, app. 11,* p. 134.

Davidson, George. Directory for the Pacific coast of the United States [including geographical positions]. Rept. 1862, app. 39,* pp. 268–430.

GRAVITY. Mendenhall, T. C. Determinations of gravity with the new half-second pendulums of the Coast and geodetic survey at stations on the Pacific coast, in Alaska, and at the base stations, Washington, D. C., and Hoboken, N. J. Rept. 1891, pt. 2, app. 15, pp. 503–564.

HISTORY. Kohl, J. G. (compiler.) Abstract of a complete historical account of the progress of discovery on the western coast of the United States from the earliest period. Rept. 1855, app. 64,* pp. 374, 375.

——— Western coast annals of maritime discovery and exploration. Rept. 1857, app. 52,* pp. 414–433.

TERRESTRIAL MAGNETISM. Schott, C. A. Secular change of the magnetic declination on the western coast. Rept. 1856, app. 31,* pp. 228–235.

——— Secular variation of the magnetic inclination on the western coast of the United States. Rept. 1856, app. 33,* pp. 246–249.

——— Magnetic stations and results [supplementary to lists given in annual reports of 1856, 1858 and 1860, pp. 351], 352. Rept. 1862, app. 20,* pp. 230, 231.

——— Report on the distribution of the magnetic declination on the coast and parts of the interior of the United States [with accompanying isogonic and isothermic chart for 1870]. Rept. 1865, app. 19,* pp. 174–176.

Trowbridge, W. P. Tidal and magnetic observations of the western coast. Rept. 1854, app. 30,* pp. 37–40.

——— Tidal and magnetic operations on the western coast. Rept. 1855, app. 34,* pp. 223–227.

TIDES. Type curves of the tides of the Pacific coast. Rept. 1865, app. 11,* p. 138.

Avery, R. S. Results computed for tide tables for charts of the western coast of the United States. Rept. 1870, app. 5,* pp. 66–69.

Bache, A. D. Cotidal lines of the Pacific coast. Rept. 1855, app. 50,* pp. 338–342.

——— Notice of earthquake waves on the western coast of the United States, on the 23d and 25th December, 1854. Rept. 1862, app. 24,* pp. 238–241.

Ferrel, William. Tides of the Pacific coast of the United States. Rept. 1882, app. 17, pp. 437–450.

Trowbridge, W. P. Tidal and magnetic observations of the western coast. Rept. 1854, app. 30,* pp. 37–40.

——— Tidal and magnetic operations on the western coast. Rept. 1855, app. 34,* pp. 223–227.

——— Method pursued in conducting tidal observations on the western coast of the United States. Rept. 1856, app. 42,* pp. 269, 270.

*See also* List of Tide tables in Part I.

WINDS. Bache, A. D. Winds of the western coast. Rept. 1857, app. 36,* pp. 354–358.

*See also* California—Northwest coast of America—Oregon—Washington.

### Pacific ocean.

Lindenkohl, A. Problems of physiography, concerning salinity and temperature of the Pacific ocean. Rept. 1898, app. 9, pp. 463–473.

CURRENTS AND TEMPERATURES. Dall, W. H. Geographical and hydrographical explorations on the coast of Alaska. Rept. 1873, app. 11,* pp. 111–122.

——— Report on the currents and temperatures of Bering sea and adjacent waters. Rept. 1880, app. 16,* pp. 297–340.

DENSITY. Putnam, G. R. Physical observations made in connection with the Pribilof islands survey of 1897. Rept. 1898, app. 5, pp. 233–241.

---

* Exhausted.

DEPTH. Bache, A. D. Notice of earthquake waves on the western coast of the United States, December 23 and 25, 1854 [and derived mean depth of Pacific ocean]. Rept. 1855, app. 51,* pp. 342-346.
——— Same. Rept. 1862, app. 24,* pp. 238-241.
*See also* Alaska—Asia—Bering sea—Caroline island—Chatham island—Hawaii—Mexico—Pacific coast—Philippine islands—Tahiti.

**Page base, Neb.**
Baldwin, A. L. On the measurement of nine base lines along the ninety-eighth meridian. Rept. 1901, app. 3, pp. 229-302.

**Pamplico-Chesapeake arc.**
Schott, C. A. The Pamplico-Chesapeake arc of the meridian and its combination with the Nantucket and the Peruvian arcs for a determination of the figure of the earth from American measures. Rept. 1877, app. 6, p. 84-95.

**Panama, Isthmus of.**
Davidson, G. Condensed account of M. Hellert's explorations on the Isthmus of Panama, including his special explorations on the Isthmus of Darien, with suggestions for conducting a future survey. Rept. 1868, app. 15,* pp. 260-277.
*See also* Nicaragua canal.

**Pan-American exposition, Buffalo, N. Y.**
(Leaflets printed for distribution at Survey's exhibit.)
The U. S. C. & G. S. Sep. pub. (1901.)
Chart publications. Sep. pub. (1901.)
Base apparatus. Sep. pub. (1901.)
Triangulation and reconnaissance. Sep. pub. (1901.)
Geodesy or measurement of the earth. Sep. pub. (1901.)
Gravity, Sep. pub. (1901.)
Tides and tidal currents. Sep. pub. (1901.)
Coast pilots. Sep. pub. (1901.)
Topography. Sep. pub. (1901.)
Magnetics. Sep. pub. (1901.)
Hydrography. Sep. pub. (1901.)
Time, latitude and longitude. Sep. pub. (1901.)
Leveling. Sep. pub. (1901.)
Weights and measures. Sep. pub. (1901.)

**Pantograph.**
Hergesheimer, E. The pantograph; its use in engraving. Rept. 1867, app. 5,* pp. 55, 56.

**Paper.**
Relative shrinkage and expansion of parchment paper and backed antiquarian paper. Rept. 1861, app. 15,* pp. 180, 181.
Effect of atmospheric moisture on the dimensions of different kinds of drawing paper. Rept. 1862, app. 27,* p. 255.
*See also* Drawing.

**Parallel arcs.** *See* Transcontinental arc.

**Parallels, Magnetic.** *See* Magnetic inclination.

**Paris, France.**
Peirce, C. S. On the value of gravity at Paris. Rept. 1881, app. 17, pp. 461-463.

**Patterson, Carlile Pollock.**
Letter relating to the tides at the entrance of Mobile bay. Rept. 1846, app. 8,* pp. 68-70.
Description of a float for observations of surface currents. Rept. 1849, app. 20,* p. 97.
General instructions in regard to inshore hydrographic work of the Coast survey. Instructions in methods of work. (1878.)†
Tribute to the memory of Carlile P. Patterson, superintendent of the Coast and geodetic survey from 1874 to 1881. Rept. 1882, app. 24, p. 559-563.
Same. Sep. pub. (1882.)*
*See also*, as Superintendent, Reports and other Survey publications 1874 to 1880, inclusive.

**Peach Tree ridge base.** *See* Atlanta Ga.

**Peirce, Benjamin.**
On longitudes from moon culminations. Rept. 1853, app. 31,* p. 84.
Longitude by moon culminations. Rept. 1854, app. 36,* pp. 108-120.
Method of determining longitudes by occultations of the Pleiades. Rept. 1855, app. 42,* pp. 267-274.
On the determination of longitude by occultations of the Pleiades. Rept. 1856, app. 24,* pp. 191-197.

---

* Exhausted. † Not for general distribution.

Determination of longitudes by occultations of the Pleiades and solar eclipses. Rept. 1857, app. 29,* pp. 311–314.
Cotidal lines of an inclosed sea, derived from the equilibrium theory. Rept. 1858, app. 30,* pp. 210–213.
Report upon the determination of the longitude of America and Europe from the solar eclipse of July 28, 1851. Rept. 1861, app. 16, pp. 182–195.
Determination of longitudes by occultations of the Pleiades. Rept. 1861, app. 17, pp. 196–221.
On the computations of the occultations of the Pleiades for longitude. Rept. 1862, app. 12,* pp. 155, 156.
Upon the tables of the moon used in the reduction of the Pleiades. Rept. 1862, app. 13,* pp. 157, 158.
Reports upon the occultations of the Pleiades in 1841–42. Rept. 1863, app. 17,* pp. 146–154.
On computations for longitudes by occultations of the Pleiades. Rept. 1864, app. 11,* p. 114.
Report on the progress of determining longitude from occultations of the Pleiades [continued from previous reports]. Rept. 1865, app. 12,* pp. 138–146.
Method of determining the corrections of lunar semidiameter, mean place, ellipticity of orbit, longitude of perihelion, coefficient of annual parallax, and longitude of Europe and America from the occultation of the Pleiades. Rept. 1865, app. 13,* pp. 146–149.
The solar eclipse of December 22, 1870. Rept. 1870, app. 16, pp. 229–232.
A new system of binary arithmetic. Rept. 1876, app. 6, pp. 81, 82.
Internal constitution of the earth. Rept. 1879, app. 14, p. 201.
*See also*, as Superintendent, Reports and other Survey publications, etc., 1867 to 1873 inclusive.

**Peirce, Charles Saunders.**
On the theory of errors of observations. Rept. 1870, app. 21,* pp. 200–224.
Description of an apparatus for recording the mean of the times of a set of observations. Rept. 1875, app. 15,* pp. 249–253.
Theory of the economy of research. Rept. 1876, app. 14,* pp. 197–201.
Measurements of gravity at initial stations in America and Europe. Rept. 1876, app. 15,* pp. 202–337.
A quincuncial projection of the sphere. Rept. 1877, app. 15, pp. 191, 192.
On the flexure of pendulum supports. Rept. 1881, app. 14, pp. 359–441.
On the deduction of the ellipticity of the earth, from pendulum experiments. Rept. 1881, app. 15, pp. 442–456.
On a method of observing the coincidence of vibration of two pendulums. Rept. 1881, app. 16, pp. 457–460.
On the value of gravity at Paris. Rept. 1881, app. 17, pp. 461–463.
Determinations of gravity at Allegheny, Ebensburg, and York, Pa. Rept. 1883, app. 19, pp. 473–487.
On the use of the noddy for measuring the amplitude of swaying in a pendulum support. Rept. 1884, app. 15, pp. 475–482.
Effect of the flexure of a pendulum upon its period of oscillation. Rept. 1884, app. 16, pp. 483–485.
Note on a device for abbreviating time reductions. Rept. 1885, app. 15, pp. 503–508.
On the influence of a noddy on the period of a pendulum. Rept. 1885, app. 16, pp. 509, 510.
On the effect of unequal temperature upon a reversible pendulum. Rept. 1885, app. 17, pp. 511–512.

**Peirce's criterion.**
Gould, B. A. Report containing directions and tables for the use of Peirce's criterion for the rejection of doubtful observations. Rept. 1854, app. 41,* pp. 128–131.

**Pendleton, A. G.**
Encroachment of the sea on the south side of Long Island. Rept. 1850, app. 8,* pp. 80, 81.

**Pendulum.**
Peirce, C. S. On the flexure of pendulum supports. Rept. 1881, app. 14, pp. 359–441.
——— On a method of observing the coincidence of vibration of two pendulums. Rept. 1881, app. 16, pp. 457–460.
——— On the use of the noddy for measuring the amplitude of swaying in a pendulum support. Rept. 1884, app. 15, pp. 475–482.
——— Effect of the flexure of a pendulum upon its period of oscillation. Rept. 1884, app. 16, pp. 483–485.
——— On the influence of a noddy on the period of a pendulum. Rept. 1885, app 16, pp. 509, 510.
——— On the effect of unequal temperature upon a reversible pendulum. Rept. 1885, app. 17, pp. 511, 512.
*See also* Figure of the earth—Gravity.

**Peninsula air-line.** *See* Florida.

**Pennsylvania.**
Boundary. Hodgkins, W. C. I. An historical account of the boundary between the states of Pennsylvania and Delaware. II. Detailed account of work on the Pennsylvania and Delaware boundary. Rept. 1893, pt. 2, app. 8, pp. 177–222.

---

* Exhausted.

TERRESTRIAL MAGNETISM. Bache, A. D. Abstract of results of a magnetic survey of Pennsylvania and parts of adjacent states in 1840 and 1841, with some additional results of 1843 and 1862. Rept. 1862, app. 19,* pp. 212–229.

Schott, C. A. Results for magnetic declination, dip, and horizontal intensity in Pennsylvania, in the District of Columbia, and in New York. Rept. 1862, app. 18,* p. 212.

*See also* Allegheny—Delaware river—Eastern oblique arc—Ebensburg—Hatboro—Philadelphia—York.

**Penobscot bay, Me.**

Ferrel, William. Tides in Penobscot bay. Rept. 1878, app. 11, pp. 268–304.

**Peril strait, Alas.**

Rodman, Hugh A. (compiler.) Alaska. General information relating to the vicinity of Chatham and Peril straits, and Cooks inlet and the region to the westward. Bull. 35. (1897.)

——— Same. Rept. 1896, pt. 2, app. 11, pp. 373–393.

*See also* Sergius narrows.

**Periodical variations.** *See* Magnetic variations.

**Personal equation.**

Bache, A. D. On a supposed personal equation in the use of the zenith telescope for determining latitude by Talcott's method. Rept. 1858, app. 20,* pp. 184–186.

Schott, C. A. Determination of time, longitude, latitude and azimuth. Rept. 1880, app. 14,* pp. 201–286.

Walker, S. C. Recapitulation of results for personal equation, 1844–1848. Rept. 1848, app. 4,* pp. 77–83.

*See also* Longitude—Time.

**Personal equation apparatus.**

Hilgard, J. E. Two forms of portable apparatus for the determination of both relative and absolute personal equation. Rept. 1874, app. 17,* pp. 156–162.

**Persons employed.** *See* List of Official reports of expenditures and of persons employed, in Part I (Administrative publications).

**Perspectographs.** *See* Phototopography.

**Peruvian arc.**

Preston, E. D. The need of a remeasurement of the Peruvian arc. Rept. 1889, app. 7,* pp. 199–208.

Schott, C. A. The Pamplico-Chesapeake arc of the meridian and its combination with the Nantucket and the Peruvian arcs for a determination of the figure of the earth from American measures. Rept. 1877, app. 6, pp. 84–95.

——— Inquiry into the relative value and need of a check of the Peruvian arc of 1736–1743. Rept. 1898, app. 4, pp. 229–232.

**Peters, Christian Henry Frederick.**

On substituting a lunar spot instead of the moon's limb in transits for determining the difference of longitude. Rept. 1856, app. 25,* pp. 198–203.

Eclipse of the sun December 22, 1870. Rept. 1871, app. 14,* pp. 180–184.

**Petersburg, Va.**

Dean, G. W. Establishment of meridian lines at Petersburg, Va., and Raleigh and Wilmington, N. C. Rept. 1854, app. 44,* p. 146.

**Philadelphia, Pa.—Longitude—Cambridge, Mass.**

Differences of longitude of Philadelphia and Greenwich, by reduction of observations at Cambridge, Mass. Rept. 1846, app. 10,* pp. 71, 72.

**Philadelphia, Pa.**

Schott, C. A. Transit of Venus, 1769. Results of observations for determining positions occupied in Lower California and at Philadelphia. Rept. 1874, app. 10,* pp. 131–133.

*See also* Delaware river—Girard college observatory.

**Philadelphia harbor, Pa.**

Marindin, H. L. Comparison of the surveys of Delaware river in front of Philadelphia, 1843 and 1878. Rept. 1880, app. 9, pp. 110–125.

Mitchell, Henry. Physical survey of the Delaware river at Philadelphia. Rept. 1878, app. 9, pp. 121–173.

**Philippine islands.**

Algué, José. Atlas of the Philippine islands. Sp. pub. 3.* (1900.)

*See also* List of Notice to mariners in Part I.

**Phosphates.**

Shaler, N. S. Phosphate beds of South Carolina. Rept. 1870, app. 19,* pp. 182–189.

---

* Exhausted.

**Photography.**

Hilgard, J. E. On the trial of Harrison's globe lens previous to its use in the photograph division. Rept. 1863, app. 24, pp. 206, 207.

Runge, C. On photography as applied to obtain an instantaneous record of lunar disturbances for determinations of longitude. Translated by J. A. Flemer. Rept. 1893, pt. 2, app. 4, pp. 117-124.

Whiting, H. L. Topographical contour, hydrographic details, and reduction, on photography and on the scale of shades suitable for complete maps. Rept. 1860, app. 20.* pp. 216-229.

Zumbrock, A. Electrotyping and photographing. Rept. 1875, app. 6,* pp. 87, 88.

*See also* Phototopography.

**Phototopography.**

Flemer, J. A. Phototopography as practiced in Italy under the auspices of the Royal military geographical institute, and as practiced in the Dominion of Canada under the auspices of the Department of the interior. Also a short historical review of other photographic surveys and publications on the subject. Rept. 1893, pt. 2, app. 3, pp. 37-116.

——— Phototopographic methods and instruments. Rept. 1897, pt. 2, app. 10, pp. 619-735.

**Physical geography.** *See* Geo-physics—Hydrography—Topography.

**Physical hydrography.** (Discussions.)

Mitchell, H. On the reclamation of tide lands and its relation to navigation. Rept. 1869, app. 5, pp. 75-104.

——— Location of harbor lines. Rept. 1871, app. 10,* pp. 144-153.

——— Alleged changes in the relative elevations of land and sea. Rept. 1877, app. 8,* pp. 98-103.

ATLANTIC COAST. Physical hydrography of the Gulf of Maine. Rept. 1879, app. 10, pp. 175-190.

CALIFORNIA. Mitchell, Henry. On the probable effect of extended piers in modifying the channel facilities of San Francisco bay near Yerba Buena island. Rept. 1870, app. 18,* pp. 180, 181.

CHESAPEAKE BAY. Winslow, Francis. Report on the oyster beds of the James river, Virginia, and of Tangier and Pocomoke sounds, Maryland and Virginia. Rept. 1881, app. 11, pp. 269-353.

DELAWARE BAY. Marindin, H. L. Comparison of the surveys of Delaware river front of Philadelphia, 1843 and 1878. Rept. 1880, app. 9, pp. 110-125.

Mitchell, Henry. Report on the delta of the Delaware. Rept. 1886, app. 10, pp. 267-279.

——— Physical survey of the Delaware river at Philadelphia. Rept. 1878, app. 9, pp. 121-173.

GEORGIA. Drake, J. C. On the sounds and estuaries of Georgia with reference to oyster culture. Bull. 19. (1891.)

MAINE. Report of Portland [Maine] harbor commission. Rept. 1855, app. 31,* pp. 200-219.

Mitchell, H. Physical survey of Portland harbor; velocities of tidal currents. Rept. 1873, app. 8,* pp. 94-102.

MASSACHUSETTS. Marindin, H. L. Encroachment of the sea upon the coast of Cape Cod, Mass., as shown by comparative surveys. Rept. 1889, app. 12, pp. 403-407.

——— Cross-sections of the shore of Cape Cod between Chatham and the Highland light-house. Rept. 1889, app. 13, pp. 409-457.

——— Changes in the shore line and anchorage areas of Cape Cod (or Provincetown) harbor, by comparison of surveys between 1835, 1867, and 1890. Rept. 1891, pt. 2, app. 8, pp. 283-288.

——— Cross sections of the shore of Cape Cod, Mass., between the Cape Cod and Long point light-houses. Rept. 1891, pt. 2, app. 9, pp. 289-341.

——— Changes in the shore lines and anchorage areas of Cape Cod (or Provincetown) harbor, as shown by a comparison of surveys made between 1867 and 1890. Bull. 24. (1891.)

——— Changes in the ocean shore lines of Nantucket island, Mass., from a comparison of surveys 1846 to 1887 and in 1891. Rept. 1892, pt. 2, app. 6, pp. 243-252.

——— Changes in the depths of the bar at the entrance to Nantucket inner harbor, Mass., 1888-1893. Rept. 1895, pt. 2, app. 5, pp. 347-354.

——— Cross sections on the north shores of Nantucket and Martha's Vineyard, Mass. Rept. 1896, pt. 2, app. 9, pp. 347-352.

——— Cross sections on the north shores of Nantucket and Martha's Vineyard, Mass. Rept. 1896, pt. 2, app. 8, pp. 305-346.

Mitchell, H. Surveys in the Merrimack river, Massachusetts. Rept. 1867, app. 14,* pp. 170-175.

——— On the movements of the sand at the eastern entrance to Vineyard sound. Rept. 1887, app. 6, pp. 159-163.

——— Nauset beach and Monomoy peninsula. Rept. 1871, app. 9,* pp. 134-143.

——— Changes in the neighborhood of Chatham and Monomoy. Rept. 1873, app. 9,* pp. 103-107.

——— Changes in the harbor of Plymouth, Mass. Rept. 1876, app. 9,* pp. 143-146.

——— Report on Monomoy and its shoals. Rept. 1886, app. 8, pp. 255-261.

——— On the movements of the sands at the eastern entrance to Vineyard sound. Rept. 1887, app. 6, pp. 159-163.

Whiting, H. L. Provincetown harbor, Massachusetts; special survey. Rept. 1867, app. 12,* pp. 149-157.

——— Shore-line changes at Edgartown harbor, Mass. Rept. 1872, app. 17,* pp. 262-265.

---

* Exhausted.

MASSACHUSETTS. Whiting, H. L. Report of changes in the shore-line and beaches of Martha's Vineyard, as derived from comparisons of recent with former surveys. Rept. 1886, app. 9, pp. 263-266.

——— (And Mitchell, H.) Reports concerning Martha's Vineyard and Nantucket. Rept. 1869, app. 15,* pp. 236-259.

MISSISSIPPI RIVER. Mitchell, H. Recent observations at South pass bar, Mississippi river. Rept. 1875, app. 11,* pp. 189-193.

——— Characteristics of South Pass, Mississippi river. Rept. 1876, app. 12, pp. 190-191.

——— Study of the effect of river bends on the Lower Mississippi. Rept. 1882, app. 16, pp. 433-436.

NEW JERSEY. Bache, A. D. Causes of increase of the Sandy Hook peninsula. Rept. 1856, app. 38,* pp. 263,264.

Harrison, A. M. Topography on the coast of New Jersey, including Sandy Hook. Rept. 1855, app. 23,* pp. 164, 165.

Mitchell, Henry. Changes in the submerged contours off Sandy Hook. Rept. 1873, app. 10,* pp. 108-110.

Whiting, H. L. Progress of Sandy Hook from 1848 to 1850. Rept. 1850, app. 9,* pp. 81, 82.

NEW YORK. Resurvey of New York bay and harbor and dependencies for the Commissioners on harbor encroachments. Rept. 1885, app. 24,* pp. 165-171.

Report to Commissioners on preservation of New York harbor from encroachment, by the Advisory council on the comparative map of New York bay and harbor and approaches, prepared by the Coast survey. Rept. 1857, app. 37,* pp. 358-373.

Böschke, A. [Comparative] maps, New York harbor. Rept. 1856, app. 48,* pp. 281, 282.

——— Report on the drawing of maps of New York harbor, made for the Commissioners on harbor encroachments. Rept. 1857, app. 38,* pp. 373, 374.

Lindenkohl, A. Geology of the sea bottom in the approaches to New York bay. Rept. 1884, app. 12, pp. 431-434.

Mitchell, H. Physical survey of New York harbor and the coast of Long Island, with descriptions of apparatus for observing currents. Rept. 1859, app. 26,* pp. 311-317.

——— Harbor of New York, 1873. Rept. 1871, app. 8, pp. 109-133.

——— Middle-ground shoal, New York harbor. Rept. 1872, app. 16,* pp. 257-261.

——— Physical survey of New York harbor. Rept. 1876, app. 10,* pp. 147-185.

——— Location of a quay or pier line in the vicinity of the United States Navy-yard at New York. Rept. 1876, app. 11, pp. 186-189.

——— Report on the results of the physical survey of New York harbor. Rept. 1887, app. 15, pp. 301-311.

Pendleton, A. G. Encroachment of the sea on the south side of Long island. Rept. 1850, app. 8,* pp. 80, 81.

NORTH CAROLINA. Huger, T. B. Comparison of hydrographic surveys in 1856 and 1858, at the entrance of Cape Fear river. Rept. 1858, app. 13,* pp. 150-151.

Maffit, J. N. Beaufort harbor. Rept. 1854, app. 14,* pp. 21-23.

——— Re-examination of the bars and estuaries to Cape Fear river. Rept. 1857, app. 17,* pp. 153-156.

Pourtales, L. F. Effect of winds in varying the level of the water in Albemarle sound. Rept. 1856, app. 43,* pp. 271, 272.

Whiting, H. L. Beaufort harbor. Rept. 1851, app. 28,* pp. 482-484.

Winslow, Francis. Report on the sounds and estuaries of North Carolina with reference to oyster culture. Bull. 10. (1889.)

*See also* Anchorages—Atmosphere—Bars—Channels—Coast features—Currents—Depths—Geology—Harbors—Hydraulics—Hydrographic surveys—Oceanography—Oyster beds—Rivers—Sea level—Shoals—Shore-line changes—Sounding—Tides—Topography—Water level—Wind effects.

**Physics.** *See* Aberration—Expansion—Electricity—Geo-physics—Hydraulics—Motion—Refraction—Spectrum—Standards—Tides.

**Physiography.** *See* Geo-physics—Hydrography—Topography.

**Pier lines.**

Mitchell, Henry. Location of harbor lines. Rept. 1871, app. 10,* pp. 144-153.

——— Location of a quay or pier line in the vicinity of the United States navy-yard at New York. Rept. 1876, app. 11, pp. 186-189.

**Piers.**

Mitchell, Henry. On the probable effect of extended piers in modifying the channel facilities of San Francisco bay near Yerba Buena island. Rept. 1870, app. 18,* pp. 180, 181.

**Pillsbury, John Elliott.**

Recent deep-sea soundings off the Atlantic coast of the United States. Rept. 1882, app. 19,* pp. 459-461.

Report on deep-sea current work in the Gulf Stream. Rept. 1885, app. 14, pp. 495-501.

A report of Gulf Stream explorations. Observations of currents, 1886. Rept. 1886, app. 11, pp. 281-290.

Gulf stream explorations; observations of currents, 1887. Rept. 1887, app. 8, pp. 173-184.

---

* Exhausted.

Gulf Stream explorations. Observations of currents, 1888–1889. Rept. 1889, app. 16, pp. 467–477.
The Gulf stream. A description of the methods employed in the investigation and the results of the research. Rept. 1890, app. 10, pp. 461–620.

**Pilotage.**
Changes in the pilotage laws of the port of New York. Notice to mariners 53. (1884.)

**Plane table.**
Harrison, A. M. On the plane table and its use in topographical surveying. Rept. 1865, app. 22, pp. 203–231.
Hergesheimer, E. A treatise on the plane table and its use in topographical surveying. Rept. 1880, app. 13,* pp. 172–200.
Schott, C. A. Height in feet corresponding to a given angle of elevation and a given distance in metres, for use in the construction of contour lines by the plane table. Rept. 1860, app. 38, p. 397.
Wainwright, D. B. A plane table manual. Rept. 1898, app. 8,* pp. 409–461.
*See also* Drawing—Surveying—Topography.

**Planets.** *See* Mars—Mercury—Venus.

**Pleiades.** *See* Occultations.

**Plumb line deflection.**
Schott, C. A. Local deflections of the zenith in the vicinity of Washington city. Rept. 1869, app. 7,* pp. 113–115.
——— Comparison of local deflection of the plumb line in latitude, longitude and azimuth at stations of the Oblique arc along our Atlantic coast as developed on Bessel's and Clarke's spheroids. Rept. 1879, app. 8, pp. 110–123.
*See also* Gravity.

**Plymouth harbor, Mass.**
Mitchell, H. Changes in the harbor of Plymouth, Mass. Rept. 1876, app. 9,* pp. 143–146.

**Pocomoke sound, N. C.**
Winslow, Francis. Report on the oyster beds of the James river, Virginia, and of Tangier and Pocomoke sounds, Maryland and Virginia. Rept. 1881, app. 11, pp. 269–353.

**Point Barrow, Alas.** *See* Ooglaamie.

**Polar distance.** *See* Declination.

**Polar motion.** *See* Latitude variation.

**Polar station.** *See* Ooglaamie.

**Polaris.**
Schott, Charles A. Approximate times of culminations and elongations and of the azimuths at elongation of Polaris for the years between 1889 and 1910. Bull. 14. (1890.)
——— Same. Rept. 1891, pt. 2, app. 1, pp. 7–13.

**Polaris, altitude of.**
Davidson, George. Azimuth and apparent altitude of Polaris. Rept. 1870, app. 22,* pp. 225–227.
Putnam, G. R. Tables of azimuth and apparent altitude of Polaris at different hour angles. Rept. 1895, pt. 2, app. 10, pp. 393–398.
*See also* Azimuth—Time.

**Polyconic projection.** *See* Projection.

**Poor, John A.**
Report of Portland [Maine] harbor commission. Rept. 1855, app. 31,* pp. 200–219.

**Port Townsend.**
Davidson, G. Occultations of $\alpha$ Scorpii and of the planet Mars at Point Hudson, Port Townshend, Washington territory, April and May, 1856. Rept. 1856, app. 26,* pp. 203–208.

**Portland harbor, Me.**
Report of Portland [Maine] harbor commission. Rept. 1855, app. 31,* pp. 200–219.
Mitchell, H. Physical survey of Portland harbor. Rept. 1873, app. 8,* pp. 94–102.

**Ports.** *See* Depths—Harbors.

**Pot rock, Hell Gate, N. Y.**
Bartlett, W. A. On Pot rock, Hell Gate. Rept. 1852, app. 8,* p. 84.

**Potomac river.**
Braid, Andrew. Refraction on lines passing near a surface of water at different elevations across the Potomac river. Rept. 1879, app. 16, pp. 212, 213.
*See also* Hog island.

---

*Exhausted.

Examination of specimens of bottom obtained in Gulf Stream. Rept. 1853, app. 30,* pp. 82, 83.

Observations on the solar eclipse of May 26, 1854, at Roslyn station, near Petersburg, Virginia. Rept. 1854, app. 40, p. 124.

(And Whiting, W. D.) Least water in channel entrances of harbors, rivers, ports and anchorages on the coasts of the United States. Rept. 1856, app. 18,* pp. 133-137.

Effect of winds in varying the level of the water in Albemarle sound. Rept. 1856, app. 43,* pp. 271, 272.

Microscopical examination of specimens of bottom from deep-sea soundings. Rept. 1858, app. 39,* pp. 248-250.

Magnetic station at Eastport, Maine. Rept. 1860, app. 27,* pp. 350, 351.

Dividers invented by J. R. Gilliss for the graphical decomposition of tide curves. Rept. 1860, app. 40,* pp. 398, 399.

(And Bache, A. D., and Schott, C. A.) Tides, currents, magnetic variation and geographical positions of light houses, Chesapeake bay. Sep. pub. (1861.)*

Fauna of the Gulf Stream. Rept. 1867, app. 16,* pp. 180-182.

Report upon dredgings near the Florida reef. Rept. 1868, app. 12,* pp. 168-170.

The Gulf Stream. Characteristics of the Atlantic sea bottom off the coast of the United States. Rept. 1869, app. 11,* pp. 220-225.

Voyage of the steamer Hassler from Boston to San Francisco. Rept. 1872, app. 11,* pp. 213-221.

**Powalky, C. R.**

New reduction of La Caille's observations, made at the Cape of Good Hope between 1749 and 1757, and given in his "Astronomiæ fundamenta," together with a comparison of the results with the "Bradley-Bessel Fundamenta;" also, a catalogue of the places of 150 stars south of declination —30, for the epochs 1750 and 1830. Rept. 1882, app. 21, pp. 469-502.

**Pratt, John F.**

Notes relating to self-registering tide gauges as used by the United States Coast and geodetic survey. Rept. 1897, pt. 2, app. 7, pp. 313-318.

**Precise leveling.** *See* Leveling.

**Preston, Erasmus Darwin.**

Determinations of gravity and other observations made in connection with the solar eclipse expedition, May, 1883, to Caroline island, south Pacific ocean. Rept. 1883, app. 17,* pp. 379-381.

Differential method of computing the apparent places of stars for determinations of latitude. Rept. 1888, app. 13, pp. 465-470.

Determinations of latitude and gravity for the Hawaiian government. Rept. 1888, app. 14, pp. 471-563.

Same, abstract. Bull. 11. (1889.)

The need of a remeasurement of the Peruvian arc. Rept. 1889, app. 7,* pp. 199-208.

Gravity and the magnetic elements on the west coast of Africa (and on some islands in the North and South Atlantic) 1889-90. Rept. 1890, app. 12, pp. 625-684.

Same, abstract. Bull. 22. (1891.)

Transit of Mercury of May 9, 1881, at Waikiki, Hawaiian islands. Rept. 1891, pt. 2, app. 12, pp. 475-477.

Observations for the variation of latitude, made near Honolulu, Oahu, Hawaiian islands, in co-operation with the work of the International geodetic association and on the determination of gravity and the magnetic elements. Rept. 1891, pt. 2, app. 13, pp. 479-485.

Variation of latitude at Waikiki, near Honolulu, Hawaiian islands, as determined from observations made in 1891 and 1892 in co-operation with the International geodetic association. Rept. 1892, pt. 2, app. 2, pp. 53-159.

Determinations of latitude, gravity, and magnetic elements at stations in the Hawaiian islands, including a result for the mean density of the earth, 1891, 1892. Rept. 1893, pt. 2, app. 12, pp. 509-638.

Results of observations for the variations of latitude at Waikiki, Hawaiian islands, in co-operation with the International geodetic association. Bull. 27. (1893.)

The constant aberration as determined from a discussion of results for variation of latitude at Waikiki, Hawaiian islands. Bull. 28. (1893.)

Gravity. No. 5 in Bull. 29. (1893.)

Telegraphic determination of the force of gravity at Baltimore, Md., from simultaneous pendulum observations at Washington and Baltimore. Rept. 1894, pt. 2, app. 2, pp. 57-70.

(And Schott, C. A., Tittmann, O. H., Smith, E., Putnam, G. R., and Fischer, E. G.) Transit of Mercury on November 10, 1894. Coast and geodetic survey office, Washington, D. C. Rept. 1895, pt. 2, app. 4,* pp. 345, 346.

Graphic method of reducing stars from mean to apparent places. Rept. 1895, pt. 2, app. 7, pp. 371-380.

The constant of aberration as determined from observations of latitude at San Francisco, California. Bull. 32. (1895.)

Establishment of the United States Naval observatory circle, and the determination of the geographical position of the center of the clock room. Rept. 1896, pt. 2, app. 6,* pp. 285-291.

---

* Exhausted.

Determination of the constant of aberration from latitude observations with the zenith telescope at Honolulu, H. I., and San Francisco, Cal. Rept. 1896, pt. 2, app. 10, pp. 353–371.
Proceedings of the International geodetic association conference at Stuttgart, Germany, October 3d to 12th, 1898, and on geodetic operations in the United States. Rept. 1898, app. 6, pp. 243–260.
The International geodetic association for the measurement of the earth. Rept. 1899, app. 3, pp. 241–269.

**Pribilof islands, Alas.**
Putnam, G. R. Physical observations made in connection with the Pribilof islands survey of 1897. Rept. 1898, app. 5, pp. 233–241.

**Primary triangulation.** *See* Triangulation.

**Prince William sound, Alas.**
Moser, J. F. Hydrographic notes, sailing directions, and charts of surveys relating to the vicinity of Prince William sound, Cooks inlet, Kadiak island, and route from Unalaska to Chignik through Unimak pass and inside the islands. 1897. Bull. 38. (1899.)

**Printing.**
Mathiot, G. Printing maps from their electrotyped plates. Rept. 1856, app. 62,* pp. 316, 317.
*See also* Electrotyping—Lithography—Paper.

**Pritchett, Henry Smith.** *See*, as Superintendent, Reports and other publications 1897–1900.

**Probable error.** *See* Least square methods.

**Problems.** *See* N-point problem—Three point problem.

**Projection.**
Projection tables for a map of North America. Rept. 1865, app. 20,* pp. 176–186.
Tables for the projection of maps, based upon a polyconic development of the Clarke spheroid, and computed from the equator to the pole. Rept. 1884, app. 6,* pp. 135–321.
Same. Ed. 2. Sp. pub. 5.* (1900.)
Craig, Thomas. A treatise on projections. Sep. pub. (1882.)
Hilgard, J. E. Table for projecting maps of large extent [and minimum distortion in represented area]. Rept. 1856, app. 58,* pp. 296–307.
——— Tables for projecting maps of large extent. Rept. 1859, app. 33,* pp. 328–358.
Peirce, C. S. A quincuncial projection of the sphere. Rept. 1877, app. 15, pp. 191, 192.
Schott, C. A. Comparison of the relative value of the polyconic projection used in the Coast and geodetic survey, with some other projections. Rept. 1880, app. 15,* pp. 287–296.
——— (And Hunt, E. B.) Tables for projecting maps, with notes on map projections. Rept. 1853, app. 39,* pp. 96–163.
*See also* Drawing—Surveying.

**Prototypes.** *See* Standards.

**Provincetown harbor, Mass.**
Marindin, H. L. Changes in the shore line and anchorage areas of Cape Cod (or Provincetown) harbor, by comparison of surveys between 1835, 1867, and 1890. Rept. 1891, pt. 2, app. 8, pp. 283–288.
——— Same, abstract. Bull. 24. (1891.)
Whiting, H. L. Special survey of Provincetown harbor, Mass. Rept. 1867, app. 12,* pp. 149–157.

**Publications.** *See* Bibliography—Coast and geodetic survey. *See also* Lists in Part I.

**Putnam, George Rockwell.**
Relative determinations of gravity, with half-second pendulums, and other pendulum investigations. Rept. 1894, pt. 2, app. 1, pp. 9–50.
(And Schott, C. A., Tittmann, O. H., Preston, E. D., Smith, E., and Fischer, E. G.) Transit of Mercury on November 10, 1894, Coast and geodetic survey office, Washington, D. C. Rept. 1895, pt. 2, app. 4,* pp. 345, 346.
Tables of azimuth and apparent altitude of Polaris at different hour angles. Rept. 1895, pt. 2, app. 10, pp. 393–398.
Field method of reducing portable transit time observations. Rept. 1896, pt. 2, app. 9, pp. 347–352.
Results of magnetic observations made in connection with the Greenland expedition of 1896, under charge of Prof. A. E. Burton. Rept. 1897, pt. 2, app. 5, pp. 285–295.
Results of pendulum observations made in 1895 and 1896. Rept. 1897, pt. 2, app. 6, pp. 297–311.
Physical observations made in connection with the Pribilof islands survey of 1897. Rept. 1898, app. 5, pp. 233–241.
Determination of relative value of gravity in Europe and the United States in 1900. Rept. 1901, app. 6, pp. 357–423.

---

* Exhausted.

**Quadrilaterals.** *See* Davidson quadrilaterals.

**Ragged mountain, Me.**

Schott, C. A. Observations of atmospheric refraction. Contribution No. II. Determination of several heights by the spirit level, and measures of refraction by zenith distances; also, observations of the barometer at Ragged mountain, Maine, by F. W. Perkins. Rept. 1876, app. 17, pp. 355-367.

**Railways.**

Hilgard, J. E. On the use of railways for geodetic surveys. Rept. 1867, app. 9, pp. 140-144.

**Raleigh, N. C.**

Dean, G. W. Establishment of meridian lines at Petersburg, Va., and Raleigh and Wilmington, N. C. Rept. 1854, app. 44,* p. 146.

**Raleigh, N. C.—Longitude—Columbia, S. C.**

Gould, B. A. On telegraphic observations for the difference of longitude between Raleigh, N. C., and Columbia, S. C. Rept. 1854, app. 41,* pp. 128-131.

**Range determination.** *See* Trajectory of shot.

**Ranges.** *See* Magnetic ranges.

**Raritan bay.** *See* New Jersey.

**Reconnaissance.**

Boutelle, C. O. On geodetic reconnaissance. Rept. 1885, app. 10, pp. 469-481.

Hodgkins, W. C. Triangulation and reconnaissance. No. 3 in Bull. 29. (1893.)

Schott, C. A. Adaptation of triangulations to the various conditions of configuration and character of the surface of the country and other causes. Rept. 1871, app. 15,* pp. 185-188.

FLORIDA. Survey of the General land office, including reports on the general topography and triangulation, on the determination of the shore line and reconnaissance of Barnes sound, Florida. Rept. 1855, app. 25,* pp. 171-176.

Gerdes, F. H. Reconnaissance of the Florida keys. Rept. 1850, app. 23,* pp. 106-110.

——— Florida coast reconnaissance. Rept. 1851, app. 31,* pp. 488-494.

Simpson, J. H. Reconnaissance made in triangulation for an air line between Fernandina and Cedar Keys, Fla. Rept. 1857, app. 41,* pp. 379-382.

GEORGIA. Evans, A. W. Topographical reconnaissance of a part of Sapelo island, Georgia, for the selection of a site for a primary base line. Rept. 1857, app. 39,* pp. 374-377.

*See also* Hydrographic surveys—Triangulation.

**Red Fish bay, Alas.**

Moser, J. F. Alaska. Hydrographic notes and sailing directions relating to portions of Alaska from Dixon entrance to Yakutat bay, including reconnaissance surveys of Cordova bay, Bucarelli bay, and Red Fish bay. 1897. Bull. 37. (1899.)

**Reduction to center.** *See* Adjustment—Tables—Triangulation.

**Reefs.**

Bartlett, W. A. Examination of reefs in Hell Gate channel and changes produced by blasting. Rept. 1851, app. 56,* pp. 553-558.

*See also* Florida reef.

**Refraction.** (Terrestrial.)

Table of factors for computing differences in elevation (in feet). Table of corrections for curvature and refraction (in feet). Sep. pub. (1900.)

Boutelle, C. O. On geodetic reconnaissance. Rept. 1885, app. 10, pp. 469-481.

Braid, Andrew. Refraction on lines passing near a surface of water, at different elevations across the Potomac river. Rept. 1879, app. 16, pp. 212, 213.

Cutts, R. D. Memoranda relating to the field work of the secondary triangulation. Rept. 1868, app. 7,* pp. 109-139.

Davidson, George. Changes of elevation and azimuth caused by the action of the sun at station, Dominguez, Cal. Rept. 1870, app. 17,* pp. 178, 179.

Schott, C. A. Observations of atmospheric refraction. Contribution No. II. Determination of several heights by the spirit level, and measures of refraction by zenith distances; also, observations of the barometer at Ragged mountain, Maine, by F. W. Perkins. Rept. 1876, app. 17, pp. 355-367.

——— Atmospheric refraction and adjustment of hypsometric measures. Contribution No III. Determination of the coefficient of refraction from zenith distances observed in northern Georgia, by Assistants C. O. Boutelle and F. P. Webber, in 1873 and 1874, and adjustment of difference of heights by the method of least squares. Rept. 1876, app. 18, pp. 368-387.

Schott, C. A. Observations for atmospheric refraction on the line Mount Diablo to Martinez, California, in connection with hypsometric measures by spirit level, the vertical circle, and barometer, 1880. Rept. 1883, app. 12, pp. 289-321.

*See also* Astronomy—Hypsometry.

---

* Exhausted.

**Regulations.** *See* List of Laws and regulations in Part I (Administrative publications).

**Reid, Harry Fielding.**
Report of an expedition to Muir Glacier, Alaska, with determinations of latitude and the magnetic elements at Gamp Muir, Glacier bay. Rept. 1891, app. 14, pp. 487-501.

**Relief models.**
Hilgard, J. E. Description of a model of the depths of the sea in the Bay of North America and Gulf of Mexico. Rept. 1884, app. 17, pp. 619-621.
Wainwright, D. B. Model of United States and Alaska. No. 13 in Bull. 29. (1893.)

**Repeaters.** *See* Electro-magnetism.

**Research.**
Peirce, C. S. Theory of the economy of research. Rept. 1876, app. 14,* pp. 197-201.

**Rhode Island.**
GEOGRAPHICAL POSITIONS. Schott, Chas. A. Geographical positions of trigonometrical points in the states of Massachusetts and Rhode Island, 1835 to 1885, including those determined by the Borden survey 1832 to 1838. Rept. 1885, app. 8, pp. 285-439.
TRIANGULATION. Results of the primary triangulation of the coast of New England, from the northeastern boundary to the vicinity of New York. Rept. 1865, app. 21,* pp. 187-203.
*See also* Atlantic coast—New England.

**Richmond, Va.—Levels—Old Point Comfort, Va.**
Schott, C. A. Resulting heights from spirit leveling between Old Point Comfort and Richmond, Va., 1884, 1891, and 1892. Rept. 1896, pt. 2, app. 2, pp. 237-246.

**Richmond, Va.—Levels—Washington, D. C.**
Schott, C. A. Resulting heights from spirit leveling between Richmond, Va., and Washington, D. C., 1883 and 1884, with releveling between Richmond and Fredericksburg in 1886, and verification leveling between the two cities, 1895. Rept. 1896, pt. 2, app. 3, pp. 247-260.

**Rincon point, Cal.** *See* San Francisco bay.

**Rivers.**
Davidson, George. Observations on certain harbor and river improvements collected on a voyage from Hongkong, via Suez, to New York. Rept. 1875, app. 18,* pp. 293-314.
Mitchell, Henry. Study of the effect of river bends in the lower Mississippi. Rept. 1882, app. 16, pp. 433-436.
*See also* Bars—Channels—Cape Fear river—Chesapeake bay—Currents—Delaware river—Depths—Harbors—Hudson river—James river—Merrimac river—Mississippi river—Potomac river.

**Rock Creek, Wyo.—Levels—Denver, Colo.**
Winston, Isaac. Resulting elevations from spirit leveling between Denver, Colo., and Rock Creek, Wyo., from observations between May 12 and October 21, 1899. Rept. 1899, app. 5, pp. 283-298.

**Rockville, Md.**
Mendenhall, T. C., Smith, E., and Schott, C. A. Variation of latitude at Rockville, Md., as determined from observations made in 1891 and 1892, in co-operation with the International geodetic association. Rept. 1892, pt. 2, app. 1, pp. 1-51.
—— Same, abstract. Bull. 25. (1892.)

**Rodgers, Christopher Raymond Perry.**
Resurvey of bar and anchorage at Beaufort harbor, North Carolina. Rept. 1857, app. 16,* pp. 152, 153.

**Rodgers, John.**
Tides at Tahiti, South Pacific ocean. Rept. 1864, app. 9,* pp. 90-92.

**Rodman, Hugh.** (compiler.)
Compilation of the most recent information relative to the harbors, anchorages, and dangers to navigation in the vicinity of Chatham and Peril straits and Cooks inlet, Alaska. Rept. 1896, pt. 2, app. 11, pp. 373-393.
Same. Title changed to General information relating to the vicinity of Chatham and Peril straits, from a recent survey by the U. S. Coast survey steamer Patterson, Lieut. Commander E. K. Moore, U. S. N., commanding, and Cooks inlet and the region to the westward, by W. H. Dall, U. S. Geological survey. Bull. 35. (1897.)

**Rods.** *See* Leveling rods.

**Ross mountain, Cal.**
Davidson, George, and Schott, C. A. Comparison of the methods of determining heights by means of leveling vertical angles and barometric measures, from observations at Bodega Head and Ross mountain, California. Rept. 1871, app. 11,* pp. 154-170.
—— Same. Rept. 1876, app. 16, pp. 338-354.

---

*Exhausted.

**Royal military geographical institute.**
Flemer, J. A. Phototopography as practiced in Italy under the auspices of the Royal military geographical institute, and as practiced in the Dominion of Canada under the auspices of the Department of the interior. Also a short historical review of other photographic surveys and publications on the subject. Rept. 1893, pt. 2, app. 3, pp. 37-116.

**Rueprecht balance.**
Hayford, John F. The Rueprecht balance belonging to the United States Office of standard weights and measures. Rept. 1895, pt. 2, app. 9,* pp. 383-392.

**Rules.** *See* List of Laws and regulations in Part I (Administrative publications).

**Rümker's catalogue.** *See* Star catalogues.

**Runge, C.**
On photography as applied to obtain an instantaneous record of lunar distances for determinations of longitude. Rept. 1893, pt. 2, app. 4, pp. 117-124.

**Russia.** *See* Siberia.

**Saegmuller, George N.**
Reconstruction of the dividing engine of the Coast and geodetic survey. Rept. 1879, app. 12,* pp. 192-198.

**Sailing directions.** *See* Coast pilot.

**St. Albans base, W. Va.**
Mendenhall, T. C., Mosman, A. T., Woodward, R. S., Tittmann, O. H. On the measurement of the Holton base, Holton, Ripley county, Ind., and the St. Albans base, Kanawha county, W. Va. Rept. 1892, pt. 2, app. 8, pp. 329-503.
Schott, C. A. Length of the St. Albans base line, West Virginia, measured in 1892. Rept. 1894, pt. 2, app. 6,* pp. 117-123.

**St. Elias, Mt., Alas.** *See* Mt. St. Elias.

**St. George island, Alas.** *See* Pribilof islands.

**St. George's bank.** *See* Georges bank.

**St. Helena.** *See* Atlantic islands.

**St. Louis, Mo.—Levels—Jefferson City, Mo.**
Schott, C. A. Heights from geodetic leveling between St. Louis and Jefferson City, Mo., 1882-1888. Rept. 1893, pt. 2, app. 2, pp. 19-36.

**St. Louis, Mo.—Levels—Sandy Hook, N. J.**
Schott, C. A. Results of the transcontinental line of geodetic spirit leveling near the parallel of 39°. Part first, from Sandy Hook, N. J., to St. Louis, Mo. Rept. 1882, app. 11,* pp. 517-556.

**St. Louis, Mo.—Longitude—Washington, D. C.**
Walker, S. C. Telegraphic operations and computations [Washington and St. Louis]. Rept. 1850, app. 13,* pp. 85-89.

**St. Paul island, Alas.**
Bryant, Charles. Meteorological register, St. Paul island, Alaska, 1870-71. Rept. 1871, app. 7,* pp. 100-108.
*See also* Pribilof islands.

**Salina, Kans.—Levels—Ellis, Kans.**
Schott, C. A. Resulting heights from spirit leveling between Salina and Ellis, Kans., from observations made by I. Winston, assistant, between July 2 and September 9, 1896. Rept. 1898, app. 1, pp. 179-193.

**Salina, Kans.—Levels—Holliday, Kans.**
Schott, C. A. Resulting heights from spirit leveling between Holliday and Salina, Kans., from observations by I. Winston, assistant, between July 11 and October 28, 1895. Rept. 1897, pt. 2, app. 4, pp. 269-283.

**Salinity.** *See* Sea water densities.

**Salinometer.** *See* Hydrometer.

**Salt Lake base, Utah.**
Eimbeck, William. Report on the measurement of the Salt Lake base line, in Utah. Rept. 1897, pt. 2, app. 12, pp. 753-774.

---

* Exhausted.

**Salt water.** *See* Sea water.

**San Buenaventura valley, Cal.**
Johnson, W. M. Features of Santa Cruz island, the valley of San Buenaventura, and the coast north of Santa Barbara channel. Rept. 1855, app. 28,* pp. 186–188.

**San Diego, Cal.**
Bache, A. D. Comparison of the diurnal inequality of the tides at San Diego, San Francisco, and Astoria, with tables. Rept. 1854, app. 46,* pp. 152–155.

**San Diego bay, Cal.**
Trinidad, Humboldt and San Diego bays. Rept. 1851, app. 50,* pp. 528–530.

**San Francisco, Cal.**
GRAVITY. Smith, Edwin. Determinations of gravity with the Kater pendulums at Auckland, New Zealand; Sydney, New South Wales; Singapore, British India; Tokio, Japan; San Francisco, Cal.; and Washington, D. C. Rept. 1884, app. 14, pp. 439–473.
LATITUDE. Preston, E. D. The constant of aberration as determined from observations of latitude at San Francisco, Cal. Bull. 32. (1895.)
——— Determination of the constant of aberration from latitude observations with the zenith telescope at Honolulu, H. I., and San Francisco, Cal. Rept. 1896, app. 10, pp. 353–371.
Schott, C. A. Variation of latitude at San Francisco, Cal., from observations made in concert with the International geodetic association, 1891 and 1892. Rept. 1893, pt. 2, app. 11, pp. 441–508.
LONGITUDE. Telegraphic determination of the longitude of San Francisco, Cal. Rept. 1870, app. 12,* p. 100.
TERRESTRIAL MAGNETISM. Schott, C. A. The direction and intensity of the earth's magnetic force at San Francisco, Cal. Bull. 33. (1895.)
TIDES. Bache, A. D. Notes on the tides at San Francisco, Cal. Rept. 1853, app. 29,* pp. 81, 82.
——— Comparison of the diurnal inequality of the tides at San Diego, San Francisco and Astoria with tables. Rept. 1854, app. 46,* pp. 152–155.

**San Francisco bay, Cal.**
HYDROGRAPHY. Mitchell, Henry. On the probable effect of extended piers in modifying the channel facilities of San Francisco bay near Yerba Buena island. Rept. 1870, app. 18,* pp. 180, 181.
TERRESTRIAL MAGNETISM. Gillmore, J. C. California, Bay of San Francisco. Magnetic ranges for determining the deviation of the compass, with short explanations of how to find the deviation and error of the compass. Sp. pub. 1. (1898.)
TIDES. Bache, A. D. On the tides of San Francisco bay [at Rincon point] Cal. Rept. 1853, app. 28,* pp. 77–81.

**Sand.**
Gibbs, Wolcott. Examination of specimens of sand taken from the base sites at Cape Florida and Cape Sable. Rept. 1856, app. 64,* pp. 318, 319.
*See also* Bars—Shoals.

**Sands, Benjamin F.**
Instruments for procuring specimens of bottom in sounding. Rept. 1855, app. 56,* p. 361.
Description of the revolving heliotrope devised by him for geodetic purposes. Rept. 1855, app. 59,* p. 364.
Description and drawing of a signal [recently devised and placed by him] in the breakers on Dog island bar, Mississippi sound. Rept. 1855, app. 60,* pp. 365, 366.
Deep-sea sounding apparatus. Rept. 1857, app. 46,* p. 398.

**Sandy Hook, N. J.**
CURRENTS. Coast currents approaching Sandy Hook. Notice to mariners 97. (1888.)
PHYSICAL HYDROGRAPHY. Bache, A. D. Causes of increase of the Sandy Hook peninsula. Rept. 1856, pp. 38,* pp. 263, 264.
Harrison, A. M. Topography on the coast of New Jersey, including Sandy Hook. Rept. 1855, app. 23,* pp. 164, 165.
Mitchell, Henry. Changes in the submerged contours off Sandy Hook. Rept. 1873, app. 10,* pp. 108–110.
Whiting, H. L. Progress of Sandy Hook from 1848 to 1850. Rept. 1850, app. 9,* pp. 81, 82.
TIDES. Christie, A. S. Comparison of the predicted with the observed times and heights of high and low water at Sandy Hook, N. J., during 1889. Rept. 1890, app. 15, pp. 705–714.
Ferrel, William. Harmonic analysis of the tides at Sandy Hook. Rept. 1883, app. 9,* pp. 247–251.

**Sandy Hook, N. J.—Levels—St. Louis, Mo.**
Schott, C. A. Results of the transcontinental line of geodetic spirit leveling near the parallel of 39°. Part first, from Sandy Hook, N. J., to St. Louis, Mo. Rept. 1882, app. 11,* pp. 517–556.

**Sandy Hook, N. J.—Levels—Dobbs Ferry, N. Y.**
Schott, C. A. Report of the results of spirit leveling of precision about New York bay and vicinity in 1886 and 1887. Rept. 1887, app. 14, pp. 275–300.

---

* Exhausted.

**Santa Barbara channel, Cal.**

Greenwell, W. E. Survey, character, and resources of the islands and main adjacent to Santa Barbara channel, California. Rept. 1857, app. 44,* pp. 392–395.

Johnson, W. M. Features of Santa Cruz island, the valley of San Buenaventura, and the coast north of Santa Barbara channel. Rept. 1855, app. 28,* pp. 186–188.

——— Topographical features of the coast adjacent to Santa Barbara channel, California. Rept. 1857, app. 43,* pp. 390, 391.

**Santa Barbara islands, Cal.**

Alden, James. Reconnaissance from San Francisco to San Diego, including Santa Barbara islands and channel. Rept. 1852, app. 18,* pp. 104–107.

**Santa Cruz island, Cal.**

Johnson, W. M. Features of Santa Cruz island, the valley of San Buenaventura, and the coast north of Santa Barbara channel. Rept. 1855, app. 28,* pp. 186–188.

**Santa Lucia, Mt.** *See* Mt. Santa Lucia.

**Sapelo island, Ga.**

Evans, A. W. Topographical reconnaissance of a part of Sapelo island, Georgia, for the selection of a site for a primary base line. Rept. 1857, app. 39,* pp. 374–377.

**Savannah, Ga.—Longitude—Fernandina, Fla.**

Bache, A. D., and Schott, C. A. Determination of the longitude of Fernandina, Amelia island, Florida, by means of chronometric exchanges with Savannah, Ga. Rept. 1857, app. 30,* pp. 314–324.

**Saxton's tide gauge.**

Hunt, E. B. Self-registering tide gauge, Saxton's. Rept. 1853, app. 38,* pp. 94–96.

**Scaffold.** *See* Signals.

**Scales.** *See* Balances—Standards.

**Schlesinger, F.**

(And Smith, Edwin.) The International latitude service at Gaithersburg, Md., and Ukiah, Cal., under the auspices of the International geodetic association. Rept. 1900, app. 3, pp. 255–484.

**Schott, Charles Anthony.**

(And E. B. Hunt.) Tables for projecting maps, with notes on map projections. Rept. 1853, app. 39,* pp. 96–163.

Adjustment of horizontal angles of a triangulation. Probable error of observation, derived from observations of horizontal angles by the methods of "dependent directions" and of "dependent angular quantities" by the method of least squares. Rept. 1854, app. 33 S,* pp. 70–95.

On the currents of Nantucket Shoals. Rept. 1854, app. 48,* pp. 161–166.

Currents in Muskeget channel and off Martha's Vineyard. Rept. 1854, app. 49,* pp. 166–168.

Tidal currents of Long Island sound and approaches. Rept. 1854, app. 50,* pp. 168–179.

Solution of normal equations by indirect elimination. Rept. 1855, app. 40,* pp. 255–264.

Comparison of star places given in Rümker's and the Twelve-year catalogues. Rept. 1855, app. 45,* pp. 278–286.

Discussion of the secular change in the magnetic declination on the Atlantic and part of the Gulf coasts of the United States. [Ed. 1.] Rept. 1855, app. 48,* pp. 306–337.

Results for declination, dip, and horizontal intensity. Rept. 1855, app. 49,* p. 337.

Magnetic observations made at stations in Delaware, Maryland and Virginia. Rept. 1856, app. 29,* pp. 226, 227.

Results of observations for declination, dip and intensity at stations in section III [Delaware, Maryland, and Virginia]. Rept. 1856, app. 30,* p. 227.

Secular change of the magnetic declination on the western coast. [Sup. to ed. 1, Rept. 1855, app. 48, above.] Rept. 1856, app. 31,* pp. 228–235.

Secular variation of the magnetic inclination in the northeastern states. Rept. 1856, app. 32,* pp. 235–245.

Secular variation of the magnetic inclination on the western coast of the United States. Rept. 1856, app. 33,* pp. 246–249.

Determination of the probable error of an observation by the differences of the observations from their arithmetical mean. Rept. 1856, app. 59,* pp. 307, 308.

(And Bache, A. D.) Determination of the longitude of Fernandina, Amelia island, Florida, by means of chronometric exchanges with Savannah, Ga. Rept. 1857, app. 30,* pp. 314–324.

On the method for determination of latitude by the zenith telescope. Rept. 1857, app. 31,* pp. 324–334.

Gradual loss of magnetism of the several magnets in use in the survey of the coast. Rept. 1857, app. 32,* pp. 334–342.

Intermediate period in the secular change of magnetic declination at Hatboro, Pennsylvania. Rept. 1858, app. 25,* pp. 192–195.

---

* Exhausted.

Secular variation of magnetic declination and dip at Washington, D. C. Rept. 1858, app. 26,* pp. 195-197.

Magnetic declination, dip and intensity in 1859. Rept. 1859, app. 23,* p. 296.

Secular change of the magnetic declination accompanied by tables showing the variation of the needle on the coasts of the United States for every tenth year from the date of the earliest reliable observation. [ed. 1, Sup. to Rept. 1855, app. 48, above.] Rept. 1859, app. 24,* pp. 296-305.

Observations of solar spots during the first seven months of the year 1860. Rept. 1860, app. 25,* pp. 321-326.

Magnetic declination, dip and horizontal intensity (determined in 1860) on Cape Cod peninsula, Long Island and New Jersey. Rept. 1860, app. 29,* p. 352.

Cauchy's interpolation formulæ, with remarks. Rept. 1860, app. 37,* pp. 392-396.

Height in feet corresponding to a given angle of elevation and a given distance in metres, for use in the construction of contour lines by plane table. Rept. 1860, app. 38,* p. 397.

(And Bache, A. D., and Pourtales, L. F.) Tides, currents, magnetic variation and geographic positions of light-houses. Chesapeake bay and its rivers, 1861. Sep. pub. (1861.)*

Observations of solar eclipse of July, 1860, at the Coast survey office, Washington, D. C. Rept. 1861, app. 20, pp. 239-241.

Secular change of magnetic intensity on the Atlantic, Gulf and Pacific coasts of the United States; intensity statistics; notes; table of annual change for Atlantic and Pacific groups. Rept. 1861, app. 22, pp. 242-251.

Distribution of the magnetic declination on the coast of the Gulf of Mexico, with a chart of the isogonic curves for 1860. Rept. 1861, app. 23, pp. 251-256.

Distribution of the magnetic declination on the coasts of Virginia, South Carolina and Georgia, with a chart of the isogonic curves for 1860. Rept. 1861, app. 24,* pp. 256-259.

Observations of solar spots at the Coast survey office. Rept. 1861, app. 25, pp. 259-261.

Results for magnetic declination, dip and horizontal intensity in Pennsylvania, in the District of Columbia and in New York. Rept. 1862, app. 18,* p. 212.

Observations of solar spots at the Coast survey office. Rept. 1862, app. 21,* pp. 231, 232.

Development of Bessel's function for periods frequently occurring in magnetic and meteorological investigations, with examples. Rept. 1862, app. 22,* pp. 232-235.

(And Dean, G. W.) Results from observations for magnetic declination, dip and intensity, in Maine and Connecticut, including also a station in the District of Columbia. Rept. 1863, app. 22,* p. 204.

The problem of determining a position by angles observed upon a number of given stations. Solution of Gauss, with example. Rept. 1864, app. 13,* pp. 116-119.

Report on the method of reduction and results of connexion of the Epping base line with the primary triangulation in the eastern states. Rept. 1864, app. 14,* pp. 120-144.

Trajectory of ricochet shots from a 15-inch Rodman gun. Rept. 1864, app. 21,* pp. 220-222.

Determination of ranges of shot from 15 and 20 inch guns. Rept. 1864, app. 22,* p. 223.

Report on the distribution of the magnetic declination on the coast and parts of the interior of the United States. Rept. 1865, app. 19,* pp. 174-176.

Geodetic connection of the two primary base lines in New York and Maryland, their degree of accordance and accuracy of the primary triangulation intervening, with the resulting angles and distances as finally adjusted. Rept. 1866, app. 8,* pp. 49-54.

Length of the Kent island base line. Rept. 1866, app. 8,* sup. p. 140.

Determination of time by the transit instrument. Rept. 1866, app. 9, pp. 55-71.

Latitude by the zenith telescope. Rept. 1866, app. 10,* pp. 72-85.

Astronomical azimuth. Rept. 1866, app. 11,* pp. 86-99.

Method of adjustment of the secondary triangulation of Long Island sound. Rept. 1868, app. 8,* pp. 140-146.

Measures of arc of meridian of 3° 23′′ between Nantucket [Mass.] and Farmington, Me. Rept. 1868, app. 9,* pp. 147-153.

Determination of time by means of the transit instrument. (Addenda to app. 9 and 10, Rept. 1866). Rept. 1868, app. 10, pp. 154-157.

Connection of the primary base lines on Kent island, Md., and on Craney island, Va., and on the degree of accuracy of the intervening primary and subprimary triangulation. Rept. 1869, app. 6,* pp. 105-112.

Local deflections of the zenith in the vicinity of Washington city. Rept. 1869, app. 7,* pp. 113-115.

Report of observations of the eclipse of the sun on August 7, 1869, made at Springfield, Ill. Rept. 1869, app. 8, pp. 145-163.

Report on the results from the observations made at the magnetical observatory on Capitol hill, Washington, D. C., between 1867 and 1869. Rept. 1869, app. 9, pp. 199-207.

Secular changes in the declination, dip and intensity of the magnetic force at Washington, D. C. Rept. 1870, app. 14,* pp. 107-110.

Observations for daily variation of the magnetic declination, made at Fort Steilacoom, Washington Territory, in 1866, and at Camp Date creek, Arizona, in 1867. Rept. 1870, app. 15,* pp. 111-114.

(And Davidson, George). Comparison of the methods of determining heights by means of leveling, vertical angles and barometric measures, from observations at Bodega head and Ross mountain, Cal. Rept. 1871, app. 11,* pp. 154-170.

Adaptation of triangulations to the various conditions of configuration and character of the surface of the country and other causes. Rept. 1871, app. 15,* pp. 185-188.

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* Exhausted.

Determination of weights to be given to observations for determining time with portable transit instrument, recorded by the chronographic method. Rept. 1872, app. 12, pp. 222–226.

Magnetic observations by means of portable instruments. Rept. 1872, app. 14,* pp. 235–254.

Measurement of a primary base line on Peach Tree ridge, near Atlanta, Ga., in 1872 and 1873. Rept. 1873, app. 12,* pp. 123–131.

Secular change of magnetic declination in the United States and other parts of North America; new discussion. [Ed. 2 under changed title.] Rept. 1874, app. 8,* pp. 72–108.

Observations of terrestrial magnetism at Key West, Fla., made between 1860–1866. Rept. 1874, app. 9,* pp. 109–130.

Transit of Venus, 1769. Results of observations for determining positions occupied in Lower California and at Philadelphia. Rept. 1874, app. 10,* pp. 131–133.

Telegraphic longitude of Key West. Rept. 1875, app. 9,* pp. 139–156.

Terrestrial magnetism. Instructions for magnetical observations. (Reprinted from Appendix no. 14, Report for 1872.) Rept. 1875, app. 16,* pp. 254–278.

(And Doolittle, M. A.) Method of closing a circuit of triangulation under certain conditions. Rept. 1875, app. 17,* pp. 279–292.

(And Davidson, George.) Comparison of the means of determining heights by means of leveling, vertical angles and barometric measures, from observations at Bodega Head and Ross mountain, Cal. Rept. 1876, app. 16, pp. 338–354.

Observations of atmospheric refraction. Contribution no. II. Determination of several heights by the spirit level, and measures of refraction by zenith distances; also, observations of the barometer at Ragged mountain, Maine, by F. W. Perkins. Rept. 1876, app. 17, pp. 355–367.

Atmospheric refraction and adjustment of hypsometric measures. Contribution no. III. Determination of the coefficient of refraction from zenith distances observed in northern Georgia, by Assistants C. O. Boutelle and F. P. Webber, in 1873 and 1874, and adjustment of difference of heights by the method of least squares. Rept. 1876, app. 18, pp. 368–387.

Hypsometric formulæ, based upon thermodynamic principles. Rept. 1876, app. 19, pp. 388–390.

Adaptation of triangulations to various conditions, depending on the configuration of a country, and on the degree of accuracy aimed at, with due consideration of the time and means available; also, method of observing horizontal angles and directions in geodetic surveys. (Reprinted with additions, from Report of 1871.) Rept. 1876, app. 20, pp. 391–399.

The Pamplico-Chesapeake arc of the meridian and its combination with the Nantucket and the Peruvian arcs, for a determination of the figure of the earth from American measures. Rept. 1877, app. 6, pp. 84–95.

Magnetic observatory at Madison, Wis. Rept. 1877, app. 7,* pp. 96, 97.

Observations of the transit of Mercury at Washington, D. C. Rept. 1878, app. 7, pp. 88–91.

Primary triangulation between Kent island, Maryland, and at Atlanta [Georgia] base lines. Rept. 1878, app. 8, pp. 92–120.

Comparison of local deflection of the plumb line in latitude, longitude and azimuth at stations of the oblique arc along our Atlantic coast as developed on Bessel's and Clarke's spheroids. Rept. 1879, app. 8, pp. 110–123.

Secular change of magnetic declination in the United States and at some foreign stations. [Ed. 3.] Sep. pub (1879.)

Same. Ed. 4. Rept. 1879, app. 9,* pp. 124–174.

Results of the longitudes of the Coast and geodetic survey determined up to the present time by the electric telegraph with preliminary adjustment by least squares. Rept. 1880, app. 6, pp. 81–92.

Determination of time, longitude, latitude and azimuth. Rept. 1880, app. 14,* pp. 201–286.

Comparison of the relative value of the polyconic projection used in the Coast and geodetic survey, with some other projections. Rept. 1880, app. 15,* pp. 287–296.

Variation of the compass off the Bahama islands at the time of the landfall of Columbus in 1492. Rept. 1880, app. 19, pp. 412–417.

Directions for magnetic observations with portable instruments. Rept. 1881, app. 8, pp. 126–158.

Declination, dip and intensity, from observations made by the United States Coast and geodetic survey between 1833 and 1882, July. Rept. 1881, app. 9, pp. 159–224.

New compensation base apparatus including the determination of the length of [two] 5-metre standard bars. Rept. 1882, app. 7, pp. 107–138.

Results of the transcontinental line of geodetic spirit leveling near the parallel of 39°. Part first, from Sandy Hook, N. J., to St. Louis, Mo. Rept. 1882, app. 11,* pp. 517–556.

Secular variation of the magnetic declination in the United States and at some foreign stations. [Ed. 5.] Rept. 1882, app. 12,* pp. 211–276.

Distribution of the magnetic declination in the United States at the epoch, January, 1885, with three isogonic charts. Rept. 1882, app. 13,* pp. 277–328.

Length of the primary base line in Yolo county, Cal. Rept. 1883, app. 11, pp. 273–288.

Observations for atmospheric refraction on the line, Mount Diablo to Martinez, California, in connection with hypsometric measures by spirit level, the vertical circle, and barometer. Rept. 1883, app. 12, pp. 289–321.

Magnetic observations under direction of the Survey, in co-operation with the U. S Signal office, at the U. S. Polar station, Ooglaamie, Point Barrow, Alaska. Rept. 1883, app. 13, pp. 323–365.

Transit of Venus of December 6, 1882, at Washington, D. C. Rept. 1883, app. 16, pp. 371–378.

Connection at Lake Ontario of the primary triangulation of the Coast and geodetic survey with that of the Lake survey. Rept. 1884, app. 9, pp. 387–390.

---

*Exhausted.

Trigonometrical determination of the heights of the stations forming the Davidson quadrilaterals, California, 1876–1882. Rept. 1884, app. 10, pp. 391–405.

Longitudes deduced in the Coast and geodetic survey from determination by means of the electric telegraph, between the years 1846 and 1885. Second adjustment. Rept. 1884, app. 11, pp. 407–430.

Geographical distribution and secular variation of the magnetic dip and intensity in the United States. Rept. 1885, app. 6, pp. 129–274.

Geographical positions of trigonometrical points in the states of Massachusetts and Rhode Island, 1835 to 1885, including those determined by the Borden survey, 1832 to 1838. Rept. 1885, app. 8, pp. 285–439.

Results deduced from the geodetic connection of the Yolo base line with the primary triangulation of California; also a reduction and adjustment of the Davidson quadrilaterals, forming part of that triangulation. Rept. 1885, app. 9, pp. 441–467.

The secular variation of the magnetic declination in the United States and at some foreign stations. [Ed. 6.] Rept. 1886, app. 12, pp. 291–407.

Fluctuations in the level of Lake Champlain, and average height of its surface above the sea. Rept. 1887, app. 7, pp. 165–172.

Heights from spirit levelings of precision between Mobile, Ala., and Carrollton (New Orleans), La., 1885–1886. Rept. 1887, app. 9, pp. 185–205.

Magnetic work of the Greely arctic expedition. Rept. 1887, app. 10, pp. 207–210.

Report of the results of spirit leveling of precision about New York bay and vicinity in 1886 and 1887. Rept. 1887, app. 14, pp. 275–300.

The value of the "Arcano del Mare" with reference to magnetic declination in the seventeenth century. Rept. 1888, app. 6, pt. 1, pp. 167–170.

Same. Bull. 5. (1888.)

Historical review of the work of the Coast and geodetic survey in connection with terrestrial magnetism. Rept. 1888, app. 6, pt. 2, pp. 171–176.

Same. Bull. 7. (1888.)

The secular variation of the magnetic needle in the United States and at some foreign stations. [Ed. 7.] Rept. 1888 app. 7, pp. 177–312.

Geographical positions of trigonometrical points in the State of Connecticut, determined by the U. S. Coast and geodetic survey, 1833 to 1886. Rept. 1888, app. 8, pp. 313–403.

Heights from spirit leveling of precision between Mobile, Ala., and Okolona, Miss. Rept. 1888, app. 10, pp. 409–426.

Heights from spirit leveling of precision between New Orleans, La., and Arkansas City, Ark. Rept. 1888, app. 11, pp. 427–453.

Heights from spirit leveling of precision between Arkansas City (on the Mississippi river) and Little Rock, Ark. Rept. 1888, app. 12, pp. 455–464.

Secular variation in the position of the agonic line of the North Atlantic and of America, between the epochs 1500 and 1900, A. D. Bull. 6. (1888.)

(And Tittman, O. H.) Relation between the metric standards of length of the U. S. Coast and geodetic survey and the U. S. Lake survey. Rept. 1889, app. 6, pp. 179–197.

Same. Bull. 17. (1889.)

Telegraphic determination of the longitude of a station on Mount Hamilton, Cal., and its trigonometrical connection with the Lick observatory. Rept. 1889, app. 8, pp. 209–212.

Same. Bull. 13. (1889.)

The distribution of the magnetic declination in the United States for the epoch 1890. Rept. 1889, app. 11, pp. 233–402.

Result of spirit leveling between tide water at Annapolis, Md., and the Capitol bench mark at Washington, D. C. Rept. 1889, app. 15, pp. 461–466.

Report on the resulting length and probable uncertainty of five principal base lines, measured with the Bache-Würdemann compensation base apparatus, between 1847 and 1855. Rept. 1889, app. 17, pp. 479–491.

Results of the absolute measures of the direction and intensity of the earth's magnetic force. Part I of Results from the magnetic observatory of the Coast and geodetic survey at Los Angeles, Cal., between the years 1882–1889. Rept. 1890, app. 8, pp. 199–241.

Results of the differential measures of the magnetic declination, with hourly readings of the unifilar traces. Part II of Results from the magnetic observations of the Coast and geodetic survey at Los Angeles, Cal., 1882–1889. Rept. 1890, app. 9, pp. 243–457.

Approximate times of culminations and elongations and the azimuths at elongation of Polaris for the years 1889–1910. Bull. 14. (1890.)

Same. Rept. 1891, pt. 2, app. 1, pp. 7–13.

Azimuth from micrometric observations of a close circumpolar star near elongation by meridian transit or by theodolite with eyepiece micrometer. Bull. 21. (1890.)

Same. Rept. 1891, pt. 2, app. 2, pp. 15–19.

The secular variation and annual change of the magnetic force at stations occupied in connection with U. S. Eclipse expedition to the west coast of Africa in 1889–1890. Rept. 1891, pt. 2, app. 3, pp. 21–39.

Same. Bull. 23. (1891.)

Results of the differential measures of the horizontal intensity. Part III of Results of the observations recorded at the U. S. Coast and geodetic survey magnetic observatory at Los Angeles, Cal. Rept. 1891, pt. 2, app. 4, pp. 41–267.

On the magnetic observations made during Bering's first voyage to the coasts of Kamchatka and eastern Asia in the years 1725–1730. Rept. 1891, pt. 2, app. 5, pp. 269–273.

Same. Bull. 20. (1891.)

Variation of latitude at Rockville, Md., as determined from observations made in 1891 and 1892, in co-operation with the International geodetic association. II. Reductions of the observations and discussion of the results. Rept. 1892, pt. 2, app. 1, [sec. 2] pp. 17-51.

Same, abstract. Bull. 25. (1892.)

Results of spirit leveling of precision between Okolona, Miss., and Odin, Ill. Rept. 1892, pt. 2, app. 3, pp. 161-203.

On the results of spirit leveling of precision between Corinth, Miss., and Memphis, Tenn., 1890 and 1891. Rept. 1892, pt. 2, app. 4, pp. 205-224.

Results of the differential measures of the vertical force component and of the variation of dip and total force. Part IV of Results of the observations recorded at the U. S. Coast and geodetic survey magnetic observatory, Los Angeles, Cal., 1882-1889. Rept. 1892, pt. 2, app. 7, pp. 253-327.

Results of magnetic observations at stations in Alaska and in the Northwest territory of the Dominion of Canada. Rept. 1892, pt. 2, app. 11, pp. 529-533.

Heights from geodetic leveling between St. Louis and Jefferson City, Mo., 1882-1888. Rept. 1893, pt. 2, app. 2, pp. 19-36.

Variation of latitude at San Francisco, Cal., from observations made in concert with the International geodetic association, 1891 and 1892. Rept. 1893, pt. 2, app. 11, pp. 441-508.

Magnetics. No. 6 in Bull. 29. (1893.)

Standard geodetic positions in southeastern Alaska, depending on astronomic observations, 1892, 1893, and 1894. Rept. 1894, pt. 2, app. 3, pp. 71-85.

Distribution of the magnetic declination in Alaska and adjacent waters for 1895, and construction of an isogonic chart for the same epoch. Rept. 1894, pt. 2, app. 4, pp. 87-100.

Same, abstract. Bull. 34. (1895.)

Length of the Holton base line, Indiana, with related experimental measures, 1891. Rept. 1894, pt. 2, app. 5,* pp. 101-116.

Length of the St. Albans base line, West Virginia. Measured in 1892. Rept. 1894, pt. 2, app. 6,* pp. 117-123.

Formulæ and tables for the computation of geodetic positions. Ed. 4. Rept. 1894, pt. 2, app. 9, pp. 277-348.

Geographic positions of trigonometric points in the State of Massachusetts determined by the U. S. Coast and geodetic survey between the years 1843 and 1894, and including those determined by the survey made by Borden in the years 1832 to 1838. Ed. 2. Rept. 1894, pt. 2, app. 10, pp. 349-615.

The secular variation in direction and intensity of the earth's magnetic force in the United States and in some adjacent countries. [Ed. 8.] Rept. 1895, pt. 2, app. 1, pp. 167-320.

Abstract of resulting longitudes of some prominent stations in Alaska and adjacent parts, as astronomically determined during 1889-1895. Rept. 1895, pt. 2, app. 3, pp. 333-344.

(And Tittmann, O. H., Preston, E. D., Smith, E., Putnam, G. R., and Fischer, E. G.) Transit of Mercury on November 10, 1894, Coast and geodetic survey office, Washington, D. C. Rept. 1895, pt. 2, app. 4,* pp. 345, 346.

Distribution of the magnetic declination in the United States for the epoch January 1, 1900. Rept. 1896, pt. 2, app. 1, pp. 147-235.

Resulting heights from spirit leveling between Old Point Comfort and Richmond, Va., 1884, 1891 and 1892. Rept. 1896, pt. 2, app. 2, pp. 237-246.

Resulting heights from spirit leveling between Richmond, Va., and Washington, D. C., 1893 and 1894, with releveling between Richmond and Fredricksburg in 1896, and verification leveling between the two cities in 1895. Rept. 1896, pt. 2, app. 3, pp. 247-260.

Resulting heights from spirit leveling between Washington, D. C., and Hagerstown, Md., 1883. Rept. 1896, pt. 2, app. 4, pp. 261-264.

Resulting heights from spirit leveling between Jefferson City, Mo., and Holliday, Kans., 1891. Rept. 1896, pt. 2, app. 5, pp. 265-284.

Distribution of the magnetic dip and the magnetic intensity in the United States, for the epoch January 1, 1900. Rept. 1897, pt. 2, app. 1, pp. 159-196.

The telegraphic longitude net of the United States, and its connection with that of Europe, 1866-1896. Rept. 1897, pt. 2, app. 2, pp. 197-261.

Resulting longitudes of Kadiak, Unalaska and Unga, Alaska, as determined chronometrically from Sitka in 1896, by the party under the charge of Fremont Morse, assistant. Rept. 1897, pt. 2, app. 3, pp. 263-268.

Resulting heights from spirit leveling between Holliday and Salina, Kans., from observations by I. Winston, assistant, between July 11 and October 28, 1895. Rept. 1897, pt. 2, app. 4, pp. 269-283.

Resulting heights from spirit leveling between Salina and Ellis, Kans., from observations made by I. Winston, assistant, between July 2 and September 9, 1896. Rept. 1898, app. 1, pp. 179-193.

Resulting heights from spirit leveling between Ellis, Kans., and Hugo, Colo., from observations by I. Winston, assistant, between June 11 and November 17, 1897. Rept. 1898, app. 2, pp. 195-214.

Resulting heights from spirit leveling between Hugo and Colorado Springs, Colo., from observations by I. Winston, assistant, between April 20 and July 8, 1898. Rept. 1898, app. 3, pp. 215-228.

Inquiry into the relative value and need of a check of the Peruvian arc of 1736-1743. Rept. 1898, app. 4, pp. 229-232.

The Transcontinental triangulation and the American arc of the parallel. Sp. pub. 4. (1900.)

The Eastern oblique arc of the United States and osculating spheroid. Sp. pub. 7. (1902.)

---

* Exhausted.

**Sea bottom.**

Hilgard, J. E. Description of a model of the depths of the sea in the Bay of North America and Gulf of Mexico. Rept. 1884, app. 17, pp. 619–621.

Lindenkohl, A. Geology of the sea bottom in the approaches to New York bay. Rept. 1884, app. 13,* pp. 435–438.

*See also* Dredging—Ocean depths—Sounding.

**Sea encroachment.** *See* Shore line changes.

**Sea level.**

Ferrel, William. Meteorological researches, Part III.—Barometric hypsometry and reduction of the barometer to sea level. Rept. 1881, app. 10, pp. 225–268.

Mitchell, Henry. Alleged changes in the relative elevations of land and sea. Rept. 1877, app. 8,* pp. 98–103.

ALBEMARLE SOUND. Pourtales, L. F. Effect of winds in varying the level of the water in Albemarle sound. Rept. 1856, app. 43,* pp. 271, 272.

HUDSON RIVER. Mitchell, Henry. Tides and currents in Nantucket and Martha's Vineyard sounds and in East river at Hell Gate, with remarks on the revision of levelings on Hudson river. Rept. 1857, app. 35,* pp. 350–354.

——— Currents in the East river at Hell Gate and Throg's Neck, the sub-currents of New York bay and harbor and levelings on the banks of the Hudson river. Rept. 1858, app. 28,* pp. 204–207.

*See also* Barometric hypsometry—Bench marks—Elevations—Hydrographic surveys—Physical hydrography—Water level—Wind effects.

**Sea water.**

Gibbs, Wolcott. Analysis of the water of New York harbor. Rept. 1856, app. 63,* pp. 317, 318.

Hilgard, J. E. On the action of sea water on metals used in the construction of instruments and on magnetic needles. Rept. 1854, app. 55,* p. 192.

Jacobsen, Oscar. On the air contained in sea water. Sep. pub. (1874.)*

Tittmann, O. H. Table for the reduction of hydrometer observations of salt-water densities. Bull. 18. (1890.)

——— Same. Rept. 1891, pt. 2, app. 6, pp. 275–277.

*See also* Hydrometer—Ocean temperatures.

**Sea water densities.**

Davidson, George. Observations on certain harbor and river improvements collected on a voyage from Hongkong, via Suez, to New York. Rept. 1875, app. 18,* pp. 293–314.

ALASKA. Putnam, G. R. Physical observations made in connection with the Pribilof islands survey of 1897. Rept. 1898, app. 5, pp. 233–241.

CHESAPEAKE BAY. Collins, Frederick. Density of the waters of the Chesapeake bay and its principal estuaries. Rept. 1877, app. 14, pp. 184–190.

GULF OF MEXICO. Lindenkohl, A. Specific gravity of the waters of the Gulf of Mexico and the Gulf Stream. Rept. 1895, pt. 2, app. 6, pp. 355–369.

PACIFIC OCEAN. Lindenkohl, A. Problems of physiography, concerning salinity and temperature of the Pacific ocean. Rept. 1898, app. 9, pp. 463–473.

*See also* Hydrometer.

**Seal islands.** *See* Pribilof islands.

**Seaman's apparatus.** *See* Thermometer.

**Seaton station.** *See* Washington, D. C.

**Secular change.** *See* Magnetic variations (Secular).

**Sediment.** *See* Shoals—Tide lands.

**Seguin base, Tex.**

Baldwin, A. L. On the measurement of nine base lines along the ninety-eighth meridian. Rept. 1901, app. 3, pp. 229–302.

**Sergius narrows, Alas.**

Moore, E. K. Predicted times of slack water at Seymour narrows, Discovery passage, B. C., and at Sergius narrows, Peril strait, Alaska, from May to December, 1899. Bull. 39. (1899.)

**Shading.**

Whiting, H. L. Topographical contour, hydrographic details, and reduction, on photography and on the scale of shades suitable for complete maps. Rept. 1860, app. 20,* pp. 216–229.

**Shaler, Nathaniel Southgate.**

Phosphate beds of South Carolina. Rept. 1870, app. 19,* pp. 182–189.

**Shelton base, Neb.**

Baldwin, A. L. On the measurement of nine base lines along the ninety-eighth meridian. Rept. 1901, app. 3, pp. 229–302.

**Sherman, Wyo.**

Cutts, R. D., and Young, Charles A. Astronomical and meteorological observations made at Sherman, Wyo. T. Rept. 1872, app. 8,* pp. 75–172.

---

* Exhausted.

**Ship canals.**

Davidson, G. Observations on certain harbor and river improvements collected on a voyage from Hongkong, via Suez, to New York. Rept. 1875, app. 18,* pp. 293-314.

——— Condensed account of M. Hellert's explorations on the Isthmus of Panama, including his special exploration on the Isthmus of Darien, with suggestions for conducting a future survey. Rept. 1868, app. 15,* pp. 260-277.

Mitchell, H. Terminal points of the proposed canals through Nicaragua and the Isthmus of Darien. Rept. 1874, app. 12, pp. 135-147.

Sonnenstern, Maximilian von. Report on the Nicaragua route for an interoceanic ship canal, with a review of other proposed routes. Sep. pub. (1874.)*

**Ships.** *See* Bibb—Blake—Hassler—Hetzel.

**Shoals.**

DELAWARE BAY. Mitchell, H. A report on the delta of the Delaware [Joe Flogger shoal]. Rept. 1886, app. 10, pp. 267-279.

MASSACHUSETTS. Mitchell, H. A report on Monomoy and its shoals. Rept. 1886, app. 8, pp. 255-261.

——— On the movements of the sands at the eastern entrance to Vineyard sound. Rept. 1887, app. 6, pp. 159-163.

Schott, C. A. On the currents of Nantucket shoals. Rept. 1854, app. 48,* pp. 161-166.

NEW YORK. Mitchell, H. Middle-ground shoal, New York harbor. Rept. 1872, app. 16,* pp. 257-261.

*See also* Bars—Channels—Currents—Depths—Harbors—Hydrographic surveys—Shore line changes—Sounding—Tides.

**Shore line changes.**

Mitchell, Henry. Alleged changes in the relative elevation of land and sea. Rept. 1877, app. 8,* pp. 98-103.

MASSACHUSETTS. Marindin, H. L. Encroachment of the sea upon the coast of Cape Cod, Mass., as shown by comparative surveys. Rept. 1889, app. 12, pp. 403-407.

——— Cross sections of the shore of Cape Cod between Chatham and the Highland lighthouse. Rept. 1889, app. 13, pp. 409-457.

——— Changes in the shore line and anchorage areas of Cape Cod (or Provincetown) harbor, by comparison of surveys between 1835, 1867, and 1890. Rept. 1891, pt. 2, app. 8, pp. 283-288.

——— Cross sections of the shore of Cape Cod, Mass., between the Cape Cod and Long Point light-houses. Rept. 1891, pt. 2, app. 9, pp. 289-341.

——— Changes in the ocean shore lines of Nantucket island, Mass., from a comparison of surveys 1846 to 1887 and in 1891. Rept. 1892, pt. 2, app 6, pp. 243-252.

——— Changes in the shore lines and anchorage areas of Cape Cod (or Provincetown) harbor, as shown by a comparison of surveys made between 1867 and 1890. Bull. 24. (1891.)

——— Cross sections on the north shores of Nantucket and Martha's Vineyard, Mass. Rept. 1896, pt. 2, app. 8,* pp. 305-346.

——— Cross sections on the north shores of Nantucket and Martha's Vineyard, Mass. Rept. 1896, pt. 2, app. 9, pp. 347-352.

Mitchell, Henry. Nauset beach and Monomoy peninsula. Rept. 1871, app. 9,* pp. 134-143.

——— Changes in the neighborhood of Chatham and Monomoy. Rept. 1873, app. 9,* pp. 103-107.

Whiting, H. L. Shore-line changes at Edgartown harbor, Mass. Rept. 1872, app. 17,* pp. 262-265.

——— Report of changes in the shore line and beaches of Martha's Vineyard, as derived from comparisons of recent with former surveys. Rept. 1886, app. 9, pp. 263-266.

NEW JERSEY. Bache, A. D. Causes of increase of the Sandy Hook peninsula. Rept. 1856, app. 38,* pp. 263, 264.

Harrison, A. M. Topography on the coast of New Jersey, including Sandy Hook. Rept. 1855, app. 23,* pp. 164, 165.

Mitchell, Henry. Changes in the submerged contours off Sandy Hook. Rept. 1873, app. 10,* pp. 108-110.

Whiting, H. L. Progress of Sandy Hook from 1848 to 1850. Rept. 1850, app. 9,* pp. 81, 82.

NEW YORK HARBOR. Report to Commissioners on preservation of New York harbor from encroachment, by the Advisory council, on the comparative map of New York bay and harbor and approaches; prepared by the Coast survey. Rept. 1857, app. 37,* pp. 358-373.

Boschke, A. [Comparative] maps, New York harbor. Rept. 1856, app. 48,* pp. 281, 282.

——— Report on the drawing of maps of New York harbor, made for the Commissioners on harbor encroachments. Rept. 1857, app. 38,* pp. 373, 374.

Pendleton, A. G. Encroachment of the sea on the south side of Long Island. Rept. 1850, app. 8,* pp. 80, 81.

*See also* Bars—Coast features—Currents—Depths—Harbors—Hydrographic surveys—Shoals—Soundings—Tides.

**Shrinkage of paper.** *See* Paper.

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* Exhausted.

**Siberia.**

Dall, W. H. Boundary line between the territory of the United States and of Russia, passing through Bering strait. Rept. 1880, app. 16,* sup. note pp. 335-340.

*See also* Asia—Bering strait.

**Sierra Nevada.**

Davidson, George. Astronomical observations on the Sierra Nevada [at Summit]. Rept. 1872, app. 9,* pp. 173-176.

**Signals.**

Boutelle, C. O. Description of tripod and scaffold as constructed and used at the stations of the primary triangulation. Rept. 1855, app. 57,* pp. 361-363.

——— Geodetic night signals. Rept. 1880, app. 8, pp. 96-109.

——— On the construction of observing tripods and scaffolds. Rept. 1882, app. 10, pp. 199-208.

Cutts, R. D. Memoranda relating to the field work of the secondary triangulation. Rept. 1868, app. 7,* pp. 109-139.

Farley, J. Description and drawing of a convenient signal for observing on secondary stations. Rept. 1855, app. 58,* pp. 363, 364.

Sands, B. F. Description of the revolving heliotrope devised by him, for geodetic surveys. Rept. 1855, app. 59,* p. 364.

——— Description and drawing of a signal recently devised and placed by him in the breakers on Dog island bar, Mississippi sound. Rept. 1855, app. 60,* pp. 365, 366.

Totten, James. On placing screw pile signals along the Florida reef. Rept. 1852, app. 14,* pp. 97, 98.

——— Screw-pile beacons on Florida reefs, with description of signals. Rept. 1855, app. 16,* pp. 157-160.

*See also* Triangulation.

**Sigsbee, Charles Dwight.**

Device for detaching from a line the heavy weights requisite in deep-sea soundings. Rept. 1874, app. 14,* p. 152.

Deep sea sounding and dredging. A description and discussion of the methods and appliances used on board the Coast and geodetic survey steamer Blake. Sep. pub. (1880.)*

**Simoda earthquake.**

Bache, A. D. Notice of earthquake waves on the western coast of the United States, on the 23d and 25th December, 1854. Rept. 1855, app. 51,* pp. 342-346.

——— Same. Rept. 1862, app. 24,* pp. 238-241.

**Simpson, J. H.**

Reconnaissance made in triangulation for an air line between Fernandina and Cedar keys, Florida. Rept. 1857, app. 41,* pp. 379-382.

**Sinclair, Cephas Hempstone.**

General index of scientific papers contained in the appendices of the annual reports of the U. S. Coast and geodetic survey, 1845-1880. Rept. 1881, app. 6, pp. 91-123.

The oblique boundary line between California and Nevada. Rept. 1900, app. 3, pp. 255-484

**Singapore, Straits settlements.**

Smith, Edwin. Determinations of gravity with the Kater pendulums at Auckland, New Zealand; Sidney, New South Wales; Singapore, British India; Tokio, Japan; San Francisco, Cal.; and Washington, D. C. Rept. 1884, app. 14, pp. 439-473.

**Sitka language.**

Vocabularies of the Kodiac, Unalashka, Kenai and Sitka languages. Rept. 1867, app. 18G,* pp. 293-298.

**Sketches.** *See* List of Catalogues of maps and charts in Part I.

**Smith, Edwin.**

Transit of Venus, Chatham island, 1874. Rept. 1875, app. 14,* pp. 231-248.

Apparatus used for observation of telegraphic longitudes. Rept. 1880, app. 7, pp. 93-95.

Determinations of gravity with the Kater pendulums at Auckland, New Zealand; Sidney, New South Wales; Singapore, British India; Tokio, Japan; San Francisco, Cal.; and Washington, D. C. Rept. 1884, app. 14, pp. 439-473.

Two new portable instruments for longitude work. Constructed at the office of the Survey from designs by Edwin Smith. Rept. 1889, app. 9,* pp. 213-216.

Same. Bull. 16. (1889.)

Variation of latitude at Rockville, Md., as determined from observations made in 1891 and 1892, in co-operation with the International geodetic association. Description of the station, instruments and methods of observing. Rept. 1892, pt. 2, app. 1, pp. 2-17.

Time, latitude and longitude. No. 4 in Bull. 29. (1893.)

Same, abstract. Bull. 25. (1892.)

Notes on some instruments recently made in the instrument division of the Coast and geodetic survey office. Rept. 1894, pt. 2, app. 8, pp. 263-275.

(And Schott, C. A., Tittman, O. H., Preston, E. D., Putnam, G. R., and Fischer, E. G.) Transit of Mercury on November 10, 1894, Coast and geodetic survey office, Washington, D. C. Rept. 1895, pt. 2, app. 4,* pp. 345, 346.

---

* Exhausted.

Determinations of gravity at the Polytechnic institute, Worcester, Mass., and at Columbia university, New York city, with pendulum apparatus B. 1899. Rept. 1899, app. 4, pp. 271-282.

(And Schlesinger, F.) The International latitude service at Gaithersburg, Md., and Ukiah, Cal., under the auspices of the International geodetic association. Rept. 1900, app. 5, pp. 495-520.

The determination of the mean value of one revolution of a micrometer screw, and the progressive and periodic errors of the screw, from observations on a circumpolar star near its elongation. Rept. 1900, app. 8, pp. 701-712.

**Soil.**

Totten, James. Climate, soil, and general character of the Florida keys. Rept. 1853, app. 18,* pp. 50, 51.

**Solar-diurnal variation.** *See* Magnetic variations.

**Solar eclipse.** *See* Eclipses.

**Solar spots.** *See* Sun spots.

**Sonnenstern, Maximilian von.**

Report on the Nicaragua route for an interoceanic ship-canal, with a review of other proposed routes. Sep. pub. (1874.)*

**Sounding.**

GULF STREAM. Bailey, J. W. On the characteristics from bottom sounding of the Florida section of the Gulf stream. Rept. 1855, app. 55,* p. 360.

Mitchell, H. Soundings across the Florida straits. Rept. 1866, app. 5,* pp. 35-44.

——— Report on soundings made to develop the character of the Strait of Florida between Key West and Havana. Rept. 1867, app. 15,* pp. 176-179.

Pillsbury, J. E. Recent deep-sea soundings off the Atlantic coast of the United States. Rept. 1882, app. 19, pp. 459-461.

NEW YORK. Mitchell, H. Preliminary report on the interference tides of Hell Gate, with directions for reducing the soundings. Rept. 1866, app. 6,* pp. 44-46.

*See also* Currents—Hydrographic surveys—Oceanography—Phycsial hydrography—Tides.

**Sounding apparatus.**

Bartlett, J. Siemens electrical deep-sea thermometer. Rept. 1882, app. 18, pp. 451-457.

Batchelder, J. M. Apparatus for harbor soundings proposed by E. B. Hunt. Rept. 1858, app. 38,* pp. 247, 248.

Craven, T. A. Specimen box for bringing up the bottom in deep sea soundings. Rept. 1854, app. 54,* pp. 191, 192.

Hunt, E. B. Deep-sea sounding apparatus. Rept. 1857, app. 47,* pp. 398, 401.

Mitchell, H. [Soundings across the Florida straits.] Rates of outrun of line. Supplement to appendix 5. Rept. 1866, app. 5,* p. 139.

Pillsbury, J. E. The Gulf Stream. A description of the methods employed in the investigation and the results of the research. Rept. 1890, app. 10, pp. 461-620.

Sands, B. F. Deep sea sounding apparatus. Description of a form proposed and used by him. Rept. 1857, app. 46,* p. 398.

Sigsbee, C. D. Device for detaching from a line the heavy weight requisite in deep-sea soundings. Rept. 1874, app. 14,* p. 152.

——— Deep sea sounding and dredging. A description and discussion of the methods used on board the Coast and geodetic survey steamer Blake. Sep. pub. (1880.)*

Temple, W. G. Trials made with the new sounding apparatus devised by E. B. Hunt. Rept. 1857, app. 48,* pp. 401, 402.

Trowbridge, W. P. Investigation of the laws of motion governing the descent of the weight in deep-sea soundings. Rept. 1858, app. 37,* pp. 228-246.

——— Apparatus and method of applying it in determining ocean depths and obtaining specimens of bottom. Rept. 1859, app. 34,* pp. 359-364.

——— Instrument devised by him to register depths in sounding and distance as a log at sea. Rept. 1861, app. 11,* pp. 135-139.

Vreeland, C. E. Description of C. & G. S. steamer Blake and her deep-sea apparatus. No. 14 in Bull. 29. (1893.)

*See also* Depths—Dredging apparatus—Oceanography.

**South Carolina.**

Schott, C. A. Distribution of the magnetic declination on the coasts of Virginia, South Carolina, and Georgia, with a chart of the isogonic curves for 1860. Rept. 1861, app. 24,* pp. 256-259.

Shaler, N. S. On the phosphate beds of South Carolina. Rept. 1870, app. 19,* pp. 182-189.

*See also* Atlantic coast—Charleston Columbia—Eastern oblique arc—Edisto island base—Maffits channel (Charleston harbor).

**South Farallon island, Cal.**

Extracts from letters addressed to the Superintendent by Lieut. W. P. Trowbridge, U. S. Engineers, assistant, relative to Bodega bay and South Farallon island, Cal. Rept. 1855, app. 27,* pp. 185, 186.

---

* Exhausted.

**South pass, Mississippi river.**

Mitchell, H. Recent observations at South pass bar, Mississippi river. Rept. 1875, app. 11,* pp. 189-193.

—— Characteristics of South pass, Mississippi river. Rept. 1876, app. 12, pp. 190, 191.

**Southern exposition, Louisville, Ky.**

Blair, H. W. Exhibit by the Coast and geodetic survey at the Southern exposition, Louisville, Ky. Rept. 1884, app. 18,* pp. 489-493.

**Specific gravity.** *See* Sea-water densities.

**Specimen box.**

Craven, T. A. Specimen box for bringing up the bottom in deep sea soundings. Rept. 1854, app. 54,* pp. 191, 192.

**Specimens.** *See* Dredging.

**Spectrum.** (Solar.)

Cutts, R. D., and Young, C. A. Astronomical and meteorological observations made at Sherman, Wyo. T. Rept. 1872, app. 8,* pt. 2, pp. 155-172.

**Sphere.** *See* Osculating spheroid—Projection.

**Spheroid.**

Schott, C. A. The eastern oblique arc of the United States and osculating spheroid. Sp. pub. 7. (1902.)

**Spirit leveling.** *See* Leveling Refraction.

**Spring governor.**

Bond, W. C. On moon culminations, with remarks on the performance of the spring governor. Rept 1853, app. 32,* pp. 84-86.

Walker, S. C. Telegraphic operations and computations [Washington and St. Louis] observed by the "American method." Rept. 1850, app. 13,* pp. 85-89.

*See also* Chronograph.

**Stadia.** *See* Plane table.

**Standards.**

Table for converting customary and metric weights and measures. Sep. pub. (1900.)

Hilgard, J. E. Results of experiments for determining the length and rate of expansion of the six-metre standard bar by heat. Rept. 1862, app. 26,* pp. 248-255.

—— Comparison of the American and British standard yards. Rept. 1877, app. 12, pp. 148-181.

—— Paper relating to metric standards distributed to the states of the Union under a joint resolution of Congress of July 27, 1866. Sep. pub. (1876.)*

—— The relation of the lawful standards of measure of the United States to those of Great Britain and France. Rept. 1876, app. 22, pp. 402-406.

Mendenhall, T. C. Fundamental standards of length and mass. Rept. 1893, pt. 2, app. 6, pp. 165-172.

—— Same. Bull. 26. (1893.)

Schott, C. A. New compensation base apparatus, including the determination of the length of [two] 5 metre standard bars. Rept. 1882, app. 7, pp. 107-138.

—— (And Tittmann, O. H.) Relation between the metric standards of length of the U. S. Coast and geodetic survey and the U. S. Lake survey. Rept. 1889, app. 6,* pp. 179-197.

—— Same. Bull. 17. (1889.)

Tittmann, O. H. Historical account of United States standards of weights and measures; of the national prototypes of the metre and the kilogramme; of their transportation from Paris to Washington; of their official opening and certification, and of their deposit in the Office of weights and measures. Rept. 1890, app. 18, pp. 735-758.

*See also* Balances—Base-measuring apparatus—Electricity—Metric system—Mile—Weights and measures office—Yard.

**Star catalogues.**

Errata in the Heis catalogue of stars. Rept. 1873, app. 15, pp. 175-180.

List of stars for observations of latitude. Rept. 1873, app. 14, pp. 138-174.

Davidson, G. The star-factors A, B, C for reducing transit observations. 1874. Sep. pub. (1874.)*

—— Field catalogue of 983 transit stars. Mean places for 1870.0. Sep. pub. (1874.)*

—— Field catalogue of 1278 time and circumpolar stars; mean places for 1885.0. Rept. 1883, app. 18, pp. 383-471.

Gould, B. A. Standard mean right ascensions of circumpolar and time stars, prepared for the use of the U. S. Coast survey. Ed. 1. Sep. pub. (1862.)

—— Same. Ed. 2. Sep. pub. (1866.)

Hilgard, J. E. Catalogue of stars for observations of latitude. Rept. 1876, app. 7, pp. 83-129.

---

* Exhausted.

Powalky, C. R. New reduction of La Caille's observations, made at the Cape of Good Hope between 1749 and 1757, and given in his "Astronomiæ fundamenta," together with a comparison of the results with the "Bradley-Bessel Fundamenta;" also, a catalogue of the places of 150 stars south of declination -30°, for the epochs 1750 and 1830. Rept. 1882, app. 21, pp. 469–502.

Schott, C. A. Comparison of star-places given in Rümker's and the Twelve-year catalogues. Rept. 1855, app. 45,* pp. 278–286.

*See also* Declination—Polaris.

**Star factors.**

Davidson, George. The star-factors A, B, C for reducing transit observations. Sep. pub. (1874.)*

**Star places.**

Preston, E. D. Differential method of computing the apparent places of stars for determinations of latitude. Rept. 1888, app. 13, pp. 465–470.

——— Graphic method of reducing stars from mean to apparent places. Rept. 1895, pt. 2, app. 7, pp. 371–380.

**Stars.**

Gould, B. A. Report and tables on the positions and proper motions of the four polar stars. Rept. 1865, app. 16,* pp. 155–159.

*See also* Polaris.

**Station error.** *See* Plumb-line deflection.

**Stations.**

Hilgard, J. E. Intervisibility of stations. Rept. 1873, app. 13,* p. 137.

*See also* Geographic positions—Triangulation.

**Statutes.** *See* List of Instructions in methods of work and of Laws and regulations in Part I (Administrative publications).

**Steamers.** *See* Bibb—Blake—Hassler—Hetzel.

**Steilacoom, Fort, Wash.** *See* Fort Steilacoom, Wash.

**Stephenville base, Tex.**

Baldwin, A. L. On the measurement of nine base lines along the ninety-eighth meridian. Rept. 1901, app. 3, pp. 229–302.

**Stevens, Isaac Ingalls.**

Upon printing from lithographic transfers. Rept. 1852, app. 21,* pp. 108–111.

**Storms, Magnetic.** *See* Magnetic variations.

**Straits settlements.** *See* Singapore.

**Stretch of paper.** *See* Paper.

**Stuttgart, Germany.**

Preston, E. D. Report on the proceedings of the International geodetic association conference at Stuttgart, Germany, October 3d to 12th, 1898. Rept. 1898, app. 6, pp. 243–260.

**Suez canal.**

Davidson, George. Observations on certain harbor and river improvements collected on a voyage from Hongkong, via Suez, to New York. Rept. 1875, app. 18,* pp. 293–314.

**Summit, Wyo.**

Colonna, B. A. Transit of Mercury, May 6, 1878, at Summit station, Central Pacific railroad. Rept. 1878, app. 6, pp. 81–87.

**Sun.**

Young, C. A. Astronomical and meteorological observations made at Sherman, Wyo. T. Rept. 1872, app. 8,* pt. 2, pp. 155–172.

*See also* Eclipse—Refraction.

**Sun spots.**

Bache, A. D. Observations of solar eclipse of July, 1860, at Gunstock mountain, N. H. Rept. 1861, app. 19, pp. 232–239.

Schott, C. A. Observations of solar spots during the first seven months of the year 1860. Rept. 1860, app. 25,* pp. 324–326.

——— Observations of the solar spots made at the Coast survey office. Rept. 1861, app. 25, pp. 259–261.

——— Observations of solar spots made at the Coast survey office. Rept. 1862, app. 21,* pp. 231, 232.

*See also* Magnetic variations.

**Surface currents.** *See* Currents.

---

*Exhausted.

**Surveying.** *See* Artificial horizon—Drawing—Geodesy—Hydrographic surveys—Plane table—Projection—Three point problem—Topographic surveys.

**Surveys.**

Trowbridge, W. P. Origin, cost and progress of foreign geodetic surveys, with other data for comparison with the United States Coast survey. Rept. 1858, app. 40,* pp. 251–270.

Special report on the comparative progress and expenditure of the Coast survey, in different years. Foreign surveys, etc. Sep. pub. (1858.)*

——— Comparison of the cost and progress of the United States Coast survey 1832 to 1844 and 1844 to 1856–57. Rept. 1858, app. 41,* pp. 270–273.

*See also* Borden survey—Coast and geodetic survey—Hydrographic surveys—Lake survey—Land surveys—Maps—Topographic surveys.

**Sweeping of harbors.** *See* Harbors.

**Sydney, N. S. W.**

Smith, Edwin. Determinations of gravity with the Kater pendulums at Auckland, New Zealand; Sydney, New South Wales; Singapore, British India; Tokio, Japan; San Francisco, Cal.; and Washington, D. C. Rept. 1884, app. 14, pp. 439–473.

**Tables tc facilitate computation.**

ASTRONOMY. Davidson, G. The star-factors A, B, C for reducing transit-observations. Sep. pub. (1874).*

Gould, B. A. Report and tables on the declination [and proper motions in declination] of the standard time stars. Rept. 1865, app. 15,* pp. 152–154.

Peirce, B. Upon the tables of the moon used in reduction of the Pleiades. Rept. 1862, app. 13,* pp. 157–158.

Putnam, G. R. Tables of azimuth and apparent altitude of Polaris at different hour angles. Rept. 1895, pt. 2, app. 10, pp. 393–398.

GEODESY. Formulæ tables and example for computing geodetic latitudes, longitudes, and azimuths. Rept. 1860, app. 36,* pp. 361–391.

Same. Ed. 2, much enlarged. Title changed to Formulæ and factors for the computation of geodetic latitudes, longitudes, and azimuths. Rept. 1875, app. 19,* pp. 315–368.

Same. Ed. 3. Rept. 1884, app. 7,* pp. 323–375.

Same. Ed. 4. Title changed to Formulæ and factors for the computation of geodetic positions. Rept. 1894, pt. 2, app. 9, pp. 277–348.

Table of coefficients for reducing inclined sights on vertical rod to horizontal distances. Sep. pub. (1900.)

Gould, B. A. Report containing directions and tables for the use of Peirce's criterion for the rejection of doubtful observations. Rept. 1854, app. 41[a],* pp. 131–138.

HYDROGRAPHY. Tittman, O. H. Table for the reduction of hydrometer observations of salt-water densities. Bull. 18. (1890.)

——— Same. Rept. 1891, pt. 2, app. 6, pp. 275–277.

HYPSOMETRY. Tables of factors for computing differences in elevation (in feet). Table of corrections for curvature and refraction (in feet). Sep. pub. (1900.)

Tables showing the height in meters, corresponding to given angles of elevation and distances in meters. Sep. pub. (1900.)

Schott, C. A. Hypsometric formulæ, based upon thermodynamic principles. Rept. 1876, app. 19, pp. 388–390.

——— Height in feet corresponding to a given angle in elevation and a given distance in metres, for use in the construction of contour lines by plane tables. Rept. 1860, app. 38,* p. 397.

LOGARITHMS. Logarithms of numbers, antilogarithms, etc. Sep. pub. (1886.)*

Duffield, W. W. Logarithms, their nature, computation and uses, with logarithmic tables of numbers and circular functions, to ten places of decimals. Pt. I. Rept. 1896, app. 12,* pp. 395–722.

PROJECTION Projection tables for a map of North America. Rept. 1865, app. 20,* pp. 176–186.

Tables for the projection of maps, based upon a polyconic development of the Clarke spheroid, and computed from the equator to the pole. Rept. 1884, app. 6,* pp. 135–321.

Tables for the projection of maps, based upon a polyconic development of the Clarke spheroid, and computed from the equator to the pole. Ed. 2. Sp. pub. 5.* (1900.)

Hilgard, J. E. Table for projecting maps of large extent [and minimum distortion in represented area]. Rept. 1856, app. 58,* pp. 296–307.

——— Tables for projecting maps of large extent. Rept. 1859, app. 33,* pp. 328–358.

Schott, C. A., and Hunt, E. B. Tables for projecting maps, with notes on map projections. Rept. 1853, app. 39,* pp. 96–163.

WEIGHTS AND MEASURES. Table for converting customary and metric weights and measures. Sep. pub. (1900.)

**Tahiti.**

Rodgers, J. Tides at Tahiti, South Pacific ocean. Rept. 1864, app. 9,* pp. 90–92.

**Talcott's method.** *See* Latitude—Micrometric measures.

**Tangier sound.**

Winslow, Francis. Report on the oyster beds of the James river, Virginia, and of Tangier and Pocomoke sounds, Maryland and Virginia. Rept. 1881, app. 11, pp. 269–353.

---

* Exhausted.

**Tapes.**

Jäderin, Edw. On the measurement of base lines with steel tapes and with steel and brass wires. Translated by J. Howard Gore. Rept. 1893, pt. 2, app. 5, pp. 125-164.

Mendenhall, T. C., Mosman, A. T., Woodward, R. S., and Schott, C. A. On the measurement of the Holton base, Holton, Ripley county, Ind., and the St. Albans base, Kanawha county, W. Va. Rept. 1892, pt. 2, app. 8, pp. 329-503.

*See also* Base measuring apparatus.

**Target.**

Tittman, O. H. Instruments and methods used in the Coast and geodetic survey for precise leveling. Rept. 1879, app. 15, pp. 202-211.

**Telegraph.** *See* Electro-magnetism—Longitude (telegraphic).

**Telegraphic longitude.** *See* Longitude (telegraphic).

**Telescopes.** *See* Lamp—Meridian instrument—Zenith telescope.

**Temperatures.** *See* Expansion—Ocean temperature—Refraction.

**Temple, W. G.**

Results of examination to determine least water on the rocks at Hell Gate, East river, New York. Rept. 1857, app. 13,* pp. 150, 151.

Trials with the new sounding apparatus devised by E. B. Hunt. Rept. 1857, app. 48,* pp. 401, 402.

**Tennessee.**

Geographical positions determined approximately in West Virginia, Kentucky, Tennessee, Alabama, Mississippi and Missouri. Rept. 1865, app. 10,* p. 137.

Schott, C. A. Results of spirit leveling of precision between Okolona, Miss., and Odin, Ill. Rept. 1892, pt. 2, app. 3, pp. 161-203.

*See also* Memphis—Mississippi river.

**Tepusquet station, Cal.**

Schott, C. A., Porter, J. S., Colonna, B. A., Lawson, J. S., Eimbeck, W., and Marr, R. A. Transit of Venus of December 6, 1882, at Washington, D. C., at Tepusquet station, California, and at Lehman's ranch, Nevada. Rept. 1883, app. 16, pp. 371-378.

**Terrestrial magnetism.**

Magnetics. (Leaflet printed for distribution at the Pan-American exposition at Buffalo, N. Y.) Sep. pub. (1901.)

Bauer, L. A. United States magnetic declination tables and isogonic charts for 1902 and principal facts relating to the earth's magnetism. Sep. pub. (1902.)

Fox, G. V. An attempt to solve the problem of the first landing place of Columbus in the New world. Rept. 1880, app. 18, pp. 346-411.

Schott, C. A. Development of Bessel's function for periods frequently occurring in magnetic and meteorological investigations, with examples. Rept. 1862, app. 22,* pp. 232-235.

——— Magnetic observations by means of portable instruments. Rept. 1872, app. 14,* pp. 235-254.

——— Same, with additions. Rept. 1875, app. 16,* pp. 254-278.

——— Directions for magnetic observations with portable instruments. Rept. 1881, app. 8, pp. 126-158.

——— Magnetic work of the Greely arctic expedition. Rept. 1887, app. 10, pp. 207-210.

——— Magnetics. The work of the Coast and geodetic survey in connection with terrestrial magnetism. (In Boutelle: Short description of articles at the Centennial Exposition of the Ohio Valley and Central States. pp. 24-35. Sep. pub. 1888.)

——— Magnetics. No. 6 in Bull. 29. (1893.)

*See also* Atmospheric electricity—Auroras—Earthquakes—Magnetic declination—Magnetic elements—Magnetic inclination—Magnetic instruments—Magnetic intensity—Magnetic observatories—Magnetic surveys—Magnetic variations—Meridian lines—Sun spots.

**Terrestrial refraction.** *See* Refraction.

**Texas.**

BASE MEASURES. Baldwin, A. L. On the measurement of nine bases along the ninety-eighth meridian. Rept. 1901, app. 3, pp. 229-302.

HYDROGRAPHIC RECONNAISSANCE. Gilbert, S. A. Coast of Texas intervening between Matagorda bay and Corpus Christi [embracing the shores of Espiritu Santo, San Antonio, and Aransas bays]. Rept. 1859, app. 32,* pp. 324-328.

Greenwell, W. E. General features and peculiarities of the coast of lower Texas, with suggestions in regard to facilities for navigation. Rept. 1854, app. 21,* pp. 30, 31.

*See also* Gulf coast—Gulf Stream.

**Theodolite.**

Supplement to the method of testing a repeating theodolite. Rept. 1860, app. 35,* pp. 357-361.

Davidson, George. Improved clamp for telescope of the theodolite. Rept. 1874, app. 15,* p. 153.

Hilgard, J. E. Method of testing a repeating theodolite. Rept. 1856, app. 61,* pp. 310-316.

——— An examination of three new 20-inch theodolites. Rept. 1877, app. 11, pp. 114-147.

---

* Exhausted.

Schott, C. A. Directions for magnetic observations with portable instruments. Rept. 1881, app. 8, pp. 126–158.

*See also* Telescope.

**Theories.** *See* Equilibrium—Tides.

**Thermometer.**

Bartlett, J. Siemens electrical deep-sea thermometer. Rept. 1882, app. 18, pp. 451–457.

*See also* Ocean temperatures.

**Thirty-ninth parallel.** *See* Transcontinental arc.

**Thorn, Frank Manley.**

Instructions and memoranda for descriptive reports to accompany original sheets. Instructions in methods of work. (1887.)†

——— Same. Rept. 1887, app. 11,* pp. 211–215.

*See also*, as Superintendent, Reports and other Survey publications, 1885 to 1888, inclusive.

**Three-point problem.**

Lindenkohl, A. Solution of the three-point problem, by determining the point of intersection of a side of the given triangle with a line from the opposite point to the unknown point. Rept. 1869, app. 14, p. 235.

**Throg's Neck, N. Y.**

Mitchell, H. Currents in the East river at Hell Gate and Throg's Neck, the sub-currents of New York bay and harbor and levelings on the banks of the Hudson river. Rept. 1858, app. 28,* pp. 204–207.

Schott, C. A. Tidal currents of Long Island sound and approaches. Rept. 1854, app. 50,* pp. 168–179.

*See also* New York harbor.

**Tidball, J. D.**

Description of the "Congress" map. Rept. 1854, app. 32,* pp. 61–63.

——— Same. Rept. 1855, app. 39,* pp. 253–255.

**Tide gauge.**

Tide gauge devised by S. D. Trenchard. Rept. 1857, app. 49,* pp. 402, 403.

Tide gauge devised by H. Mitchell. Rept. 1857, app. 50,* pp. 403, 404.

Bache, A. D. Self-registering tide gauge. Instructions for observers. Instructions in methods of work. (1859.)†

Batchelder, J. M. Apparatus for harbor soundings. Rept. 1858, app. 38,* pp. 247, 248.

——— Hunt's tide meter. Rept. 1859, app. 35,* pp. 365, 366.

Hunt, E. B. Saxton's self-registering tide gauge. Rept. 1853, app. 38,* pp. 94–96.

Marindin, H. L. A syphon tide-gauge for the open seacoast. Bull. 12. (1889.)

Mitchell, H. Description of tide gauge used at stations on the open seacoast and in situations exposed to strong currents. Rept. 1854, app. 53,* pp. 190, 191.

Pratt, J. F. Notes relating to self-registering tide gauges as used by the United States Coast and geodetic survey. Rept. 1897, app. 7, pp. 313–318.

*See also* Tide indicator.

**Tide lands.** *See* Hydrographic surveys—Sea level—Shore line changes—Tides.

**Tide indicator.**

Tide indicator in Delaware river, Delaware. Notice to mariners 202. (1896.)

**Tide-predicting machine.**

Ferrell, William. Harmonic analysis of the tides at Sandy Hook. Rept. 1883, app. 9, pp. 247–251.

——— A maxima and minima tide predicting machine. Rept. 1883, app. 10, pp. 253–272.

**Tides.**

Directions for observations of tides. Printed for the use of the tidal observers from the manuscript instructions. Instructions for methods of work. (1852.)†

Description of bench marks at tidal stations. Rept. 1870, app. 10,* pp. 92–97.

Tides and tidal currents. (Leaflet printed for distribution at the Pan-American exposition at Buffalo, N. Y.) Sep. pub. (1901.)

Avery, R. S. Mode of forming brief prediction tide tables. Rept. 1870, app. 6,* pp. 70–74.

——— Field and office work relating to tides. Rept. 1872, app. 6,* pp. 69–72.

——— Methods of registering tidal observations. Rept. 1876, app. 8,* pp. 130–142.

Bache, A. D. Tide tables for the use of navigators. Rept. 1856, app. 17,* pp. 120–133.

——— Tide tables for the use of navigators. Rept. 1861, app. 9,* pp. 98–131.

Christie, A. S., and Haskell, E. E. Tides and currents. No. 9 in Bull. 29.* (1893.)

Davidson, George. Observations on certain harbor and river improvements collected on a voyage from Hongkong, via Suez, to New York. Rept. 1875, app. 18,* pp. 293–314.

Gilliss, J. R. Dividers for graphical decomposition of tidal curves invented by [him]. Rept. 1860, app. 40,* pp. 398, 399.

Harris, R. A. Manual of tides. Part I. Introduction and historical treatment of the subject. Rept. 1897, pt. 2, app. 8, pp. 319–469.

---

* Exhausted. † Not for general distribution.

Harris, R. A. Manual of tides. Part II. Tidal observation, equilibrium theory, and harmonic analysis. Rept. 1897, pt. 2, app. 9, pp. 471-618.

——— Manual of tides. Part III. Some connections between harmonic and nonharmonic quantities, including applications to the reduction and prediction of tides. Rept. 1894, pt. 2, app. 7, pp. 125-262.

——— Manual of tides. Part IVa. Outlines of tidal theory. Rept. 1900, app. 7, pp. 535-700.

Hayford, J. F. On the use of observations of currents for prediction purposes. Rept. 1890, app 14, pp. 691-703.

Hilgard, J. E. Tides and tidal action in harbors. Sep. pub. (1876.)*

Mitchell, H. Method of determining elevations along the course of a tidal river without the aid of a leveling instrument. Rept. 1870, app. 11,* pp. 98, 99.

ALABAMA. Patterson, C. P. Letter relating to the tides at the entrance of Mobile bay. Rept. 1846, app. 8,* pp. 68-70.

ALASKA. Dall, W. H. Harbors of Alaska and the tides and currents in their vicinity. Rept. 1872, app. 10,* pp. 177-212.

Moore, E. K. Predicted times of slack water at Seymour narrows, Discovery passage, B. C., and at Sergius narrows, Peril strait, Alaska, from May to December, 1899. Bull. 39.* (1899).

ATLANTIC COAST. Bache, A. D. Heights of the tides of the Atlantic coast of the United States. Rept. 1857, app. 33,* pp. 342-347.

Bache, A. D. Preliminary determinations of cotidal lines on the Atlantic coast of the United States from Coast survey observations. Rept. 1854, app. 45,* pp. 147-152.

Ferrel, W. Minima and maxima of tides on the coast of New England for 1873. Rept. 1872, app. 7,* pp. 73, 74.

Mitchell, H. Physical hydrography of the Gulf of Maine. Rept. 1879, app. 10, pp. 175-190.

CALIFORNIA. Bache, A. D. On the tides of San Francisco bay [at Rincon point], Cal. Rept. 1853, app. 28,* pp. 77-81.

——— Notes on the tides at San Francisco, Cal. Rept. 1853, app. 29,* pp. 81, 82.

——— Comparison of the diurnal inequality of the tides at San Diego, San Francisco, and Astoria, with tables. Rept. 1854, app. 46,* pp. 152-155.

Peirce, Benjamin. Co-tidal lines of an inclosed sea derived from the equilibrium theory. Rept. 1858, app. 30,* pp. 210-213.

DELAWARE RIVER. Coast of the United States. Tidal indicator in Delaware river. Notice to mariners 202. (1896.)

Mitchell, H. New rule for currents in Delaware bay and river. Rept. 1881, app. 18, pp. 464-469.

——— Estuary of the Delaware. Rept. 1883, app. 8, pp. 239-245.

FLORIDA. Bache, A. D. On the tides at Key West, Fla. Rept. 1853, app. 27,* pp. 71-76.

Gerdes, F. H. Florida coast reconnaissance. Rept. 1851, app. 31,* pp. 488-494.

GULF OF MAINE. Gulf of Maine. Tidal currents at entrance. Notice to mariners 15. (1878.)

GULF OF MEXICO. Bache, A. D. Tidal observations on the Gulf of Mexico and type curves at the several stations showing their decomposition into diurnal and semidiurnal tides. Rept. 1855, app. 52,* pp. 346, 347.

——— Approximate co-tidal lines of diurnal and semidiurnal tides of the coast of the United States on the Gulf of Mexico. Rept. 1856, app. 35,* pp. 252-260.

——— Type curves in the Gulf of Mexico. Rept. 1856, app. 36,* pp. 260, 261.

——— Additional researches on cotidal lines in the Gulf of Mexico. Rept. 1862, app. 9,* pp. 126-128.

MAINE. Tide tables for the Atlantic and Pacific coasts. [Predictions for Eastport, Me., as a specimen.] Rept. 1866, app. 7,* pp. 47-49.

Ferrel, William. Tides in Penobscot bay. Rept. 1878, app. 11, pp. 268-304.

Mitchell, H. Physical survey of Portland harbor. Rept. 1873, app. 8,* pp. 94-102.

MASSACHUSETTS. Ferrel, William. Discussion of tides in Boston harbor. Rept. 1868, app. 5, pp. 51-102.

——— On the moon's mass as deduced from a discussion of the tides of Boston harbor. Rept. 1870, app. 20,* pp. 190-199.

——— Meteorological effects on tides. Rept. 1871, app. 6,* pp. 93-99.

Marindin, H. L. Tides and currents in the harbor of Edgartown and in Katama bay. Rept. 1892, pt. 2, app., 5 pp. 225-241.

Mitchell, H. Tidal observations on the south shore of Massachusetts and in Nantucket and Vineyard sounds. Rept. 1854, app. 29,* pp. 35-37.

——— Tidal observations made in Nantucket sound. Rept. 1855, app. 33,* pp. 222, 223.

——— Interference tides of Martha's Vineyard and Nantucket sounds. Rept. 1856, app. 37,* pp. 261-263.

——— Tides and currents in Martha's Vineyard sounds and in East river at Hell Gate with remarks on the revision of levelings on Hudson river. Rept. 1857, app. 35,* pp. 350-354.

——— On the movements of the sands at the eastern entrance to Vineyard sound. Rept. 1887, app. 6, pp. 159-163.

Whiting, H. L., and Mitchell, H. Reports concerning Martha's Vineyard and Nantucket. Rept. 1869, app. 15,* pp. 236-259.

MISSISSIPPI. Bache, A. D. Discussion of tidal observations at Cat island. Rept. 1851, app. 7,* pp. 127-136.

——— Same. Rept. 1866, app. 18,* pp. 113-119.

——— Discussion of tidal observations at Cat island in the Gulf of Mexico. Rept. 1852, app. 22,* pp. 111-122.

---

* Exhausted.

Dean, G. W. Effect of the wind on the height of the water in Cat island harbor, Mississippi. Rept. 1856, app. 45,* pp. 276–278.

NEW ENGLAND. Ferrel, William. Maxima and minima of tides on the coast of New England for 1873. Rept. 1872, app. 7,* pp. 73, 74.

NEW JERSEY. Bache, A. D. Causes of increase of the Sandy Hook peninsula. Rept. 1856, app. 38,* pp. 263, 264.

Christie, A. S. Comparison of the predicted with the observed times and heights of high and low water at Sandy Hook, N. J., during 1889. Rept. 1890, app. 15, pp. 705–714.

Ferrel, William. Harmonic analysis of the tides at Sandy Hook. Rept. 1883, app. 9, pp. 247–251.

NEW YORK. Bache, A. D. Tidal currents of New York harbor near Sandy Hook. Rept. 1858, app. 27,* pp. 197–203.

Ferrel, William. Discussion of tides in New York harbor. Rept. 1875, app. 12, pp. 194–221.

——— On the harmonic analysis of the tides at Governor's island, New York harbor. Rept. 1885, app. 13, pp. 489–493.

Marindin, H. L. Tide levels and flow of currents in New York bay and harbor. Rept. 1888, app. 9, pp. 405–408.

——— Same, abstract. Bull. 3. (1888.)

Mitchell, H. Tides and tidal currents of New York harbor and its dependencies and at Sandy Hook. Rept. 1856, app. 39,* pp. 264–266.

——— Tides and currents in Nantucket and Martha's Vineyard sounds and in East river at Hellgate with remarks on the revision of levelings on Hudson river. Rept. 1857, app. 35,* pp. 350–354.

——— Preliminary report on the interference tides of Hell Gate, with directions for reducing the soundings. Rept. 1866, app. 6,* pp. 44–46.

——— Tides and currents of Hell Gate, N. Y. Rept. 1867, app. 13,* pp. 158–169.

——— Harbor of New York, 1873. Rept. 1871, app. 8,* pp. 109–133.

——— Circulation of the sea through New York harbor. Rept. 1886, app. 13, pp. 409–432.

——— Report on the results of the physical surveys of New York harbor. Rept. 1887, app. 15, pp. 301–311.

Schott, C. A. Tidal currents of Long Island sound and approaches. Rept. 1854, app. 50,* pp. 168–179.

Würdemann, G. On tidal observations made between New York city and Albany. Rept. 1856, app. 40,* pp. 266, 267.

NORTH CAROLINA. Pourtales, L. F. Effect of winds in varying the level of the water in Albemarle sound. Rept. 1856, app. 43,* pp. 271, 272.

OREGON. Bache, A. D. Comparison of the diurnal inequality of the tides at San Diego, San Francisco, and Astoria, with tables. Rept. 1854, app. 46,* pp. 152–155.

PACIFIC COAST. Type curves of the tides of the Pacific coast. Rept. 1865, app. 11,* p. 138.

Avery, R. S. Results computed for tide tables for charts of the western coast. Rept. 1870, app. 5,* pp. 66–69.

Bache, A. D. Cotidal lines of the Pacific coast. Rept. 1855, app. 50,* pp. 338–342.

——— Notice of earthquake waves on the western coast of the United States. Rept. 1862, app. 24,* pp. 238–241.

Ferrel, William. Tides of the Pacific coast of the United States. Rept. 1882, app. 17, pp. 437–450.

Trowbridge, W. P. Tidal and magnetic observations of the western coast. Rept. 1854, app. 30,* pp. 37–40.

——— Tidal and magnetic operations on the western coast. Rept. 1855, app. 34,* pp. 223–227.

——— Method pursued in conducting tidal observations on the western coast of the United States. Rept. 1856, app. 42,* pp. 269, 270.

PACIFIC OCEAN. Rodgers, J. Tides at Tahiti, South Pacific ocean. Rept. 1864, app. 9,* pp. 91, 92.

VINEYARD SOUND. Mitchell, Henry. On the movements of the sands at the eastern entrance to Vineyard sound. Rept. 1887, app. 6, pp. 159–163.

*See also* Bench marks—Cotidal lines—Currents—Earthquake waves—Elevations—Equilibrium theory—Harbors—Harmonic analysis—Hydrographic surveys—Instruments—Leveling—Mathematics—Moon—Physics—Sea level—Tables—Tide gauge—Tide indicator—Tide tables—Tide predicting machine—Water level. *See also* List of Tide tables in Part I (Administrative publications).

**Tilton, Benjamin Ellsworth.**

Resulting elevations from spirit leveling between Abilene, Kans., and Norfolk, Neb. Rept. 1899, app. 6, pp. 299–320.

**Time.**

Time, latitude, and longitude. (Leaflet printed for distribution at the Pan-American exposition.) Sep. pub. (1901.)

Hayford, J. F. Determination of time, longitude, latitude, and azimuth. Rept. 1898, app. 7, pp. 261–409.

Hilgard, J. E. On the use of the zenith telescope for observations of time. Rept. 1869, app. 12, pp. 226–232.

Peirce, C. S. Description of an apparatus for recording the mean of the times of a set of observations. Rept. 1875, app. 15,* pp. 249–253.

——— Note on a device for abbreviating time reductions. Rept. 1885, app. 15, pp. 503–508.

---

* Exhausted.

Putnam, G. R. Field method for reducing portable transit-time observations. Rept. 1896, pt. 2, app. 9, pp. 347–352.

Schott, C. A. Determination of time by the transit instrument. Rept. 1866, app. 9, pp. 55–71.

——— Addenda to appendices nos. 9 and 10, Coast survey report for 1866 [on the determination of time by means of the transit instrument]. Rept. 1868, app. 10, pp. 157–165.

——— Determination of weights to be given to observations for determining time with portable transit instrument, recorded by the chronographic method. Rept. 1872, app. 12, pp. 222–226.

——— Determination of time, longitude, latitude, and azimuth. Rept. 1880, app. 14,* pp. 201–286.

Sinclair, C. H. Time, latitude, and longitude. No. 4 in Bull. 29. (1893.)

*See also* Chronograph—Longitude—Meridian instrument—Personal equation apparatus—Transit instrument—Zenith telescope.

**Time stars.** *See* Star places.

**Tittmann, Otto Hilgard.**

Instruments and methods used in the Coast and geodetic survey for precise leveling. Rept. 1879, app. 15, pp. 202–211.

On a method of readily transferring the underground mark at a base monument. Rept. 1881, app. 13, pp. 357, 358.

(And Schott, C. A.) Relation between the metric standards of length of the U. S. Coast and geodetic survey and the U. S. Lake survey. Rept. 1889, app. 6,* pp. 179–197.

Same. Bull. 17. (1889.)

Verification of weights and measures. Bull. 15. (1889.)

On the relation of the yard to the metre. Rept. 1890, app. 16,* pp. 715–720.

Same. Bull. 9. (1889.)

Historical account of United States standards of weights and measures; of the national prototypes of the metre and the kilogramme; of their transportation from Paris to Washington; of their official opening and certification, and of their deposit in the Office of weights and measures. Rept. 1890, app. 18, pp. 735–758.

Reduction of hydrometer observations of salt-water densities. Rept. 1891, pt. 2, app. 6, pp. 275–277.

Same. Bull. 18. (1890.)

The new secondary base apparatus of the Coast and geodetic survey as used in the measurement of the Holton base, Indiana. Rept. 1892, pt. 2, app. 8, [sec.] 3, pp. 490–503.

Weights and measures. No. 12 in Bull. 29. (1893.)

(And Schott, C. A., Preston, E. D., Smith, E., Putnam, G. R. and Fischer, E. G.) Transit of Mercury on November 10, 1894, Coast and geodetic survey office, Washington, D. C. Rept. 1895, pt. 2, app. 4,* pp. 345, 346.

*See also*, as Superintendent, Reports and other Survey publications, 1900–1902.

**Tokyo, Japan.**

Smith, Edwin. Determinations of gravity with the Kater pendulums at Auckland, New Zealand; Sydney, New South Wales; Singapore, British India; Tokio, Japan; San Francisco, Cal. and Washington, D. C. Rept. 1884, app. 14, pp. 439–473.

**Topographic conference.**

Proceedings of the topographical conference held at Washington, D. C., January 18 to March 7, 1892. Rept. 1891, pt. 2, app. 16, pp. 565–746.

**Topographic instruments.**

*See* Artificial horizon—Interranger—Level—Phototopography—Plane table—Transit.

**Topographic sheets.**

List of original topographic and hydrographic sheets, geographically arranged, registered in the archives of the United States Coast and geodetic survey from January, 1834, to December 31, 1895. Rept. 1895, pt. 2, app. 11, pp. 399–516.

**Topographic surveys.**

Topography. (Leaflet printed for distribution at the Pan-American exposition) Sep. pub. (1901.)

Hergesheimer, E. Type forms of topography, Columbia river. Rept. 1881, app. 7, pp. 124, 125.

Schott, C. A. Height in feet corresponding to a given angle of elevation and a given distance in metres, for use in the construction of contour lines by plane table. Rept. 1860, app. 38,* p. 397.

Thorn, F. M. Instructions and memoranda for descriptive reports to accompany original sheets. Instructions in methods of work. (1887.)†

Whiting, H. L. Topography. No. 7 in Bull. 29. (1893.)

——— Topographical contour, hydrographic details and reduction, on photography and on the scale of shades suitable for complete maps. Rept. 1860, app. 20,* pp. 216–229.

CALIFORNIA. Johnson, W. M. Topographical features of the coast adjacent to Santa Barbara channel. Rept. 1857, app. 43,* pp. 390, 391.

——— Features of Santa Cruz island, the valley of San Buenaventura, and the coast north of Santa Barbara channel. Rept. 1855, app. 28,* pp. 186–188.

---

* Exhausted. † Not for general distribution.

NEW JERSEY. Harrison, A. M. Topography on the coast of New Jersey, including Sandy Hook. Rept. 1855, app. 23,* pp. 164, 165.

NEW YORK. Gerdes, F. H. Topographic survey of Manhattan island. Rept. 1855, app. 21,* pp. 162, 163.

*See also* Contours—Drawing—Hydrographic surveys—Phototopography—Plane table—Reconnaissance—Surveys—Three-point problem. *See also* List of Laws and instructions in Part I (Administrative publications).

**Tornadoes.**

Ferrel, William. On cyclones, tornados and water spouts. Part II of Meteorological researches for the use of the Coast pilot. Rept. 1878, app. 10,* pp. 175–267.

**Totten, James.**

On placing screw piles along the Florida reef. Rept. 1852, app. 14,* pp. 97, 98.

Climate, soil, and general character of the Florida keys. Rept. 1853, app. 18,* pp. 50, 51.

Screw-pile beacons on Florida reefs, with description of signals. Rept. 1855, app. 16,* pp. 157–160.

**Towers.** *See* Signals.

**Townsend, Charles Hervey.**

On an early chart of Long Island sound. Rept. 1890, app. 20, pp. 775–777.

**Trajectory of shot.**

Schott, C. A. Trajectory of ricochet shots from a 15-inch Rodman gun. Rept. 1864, app. 21,* pp. 220–222.

——— Determination of ranges of shot from 15 and 20 inch guns. Rept. 1864, app. 22,* p. 223.

**Transatlantic longitude.** *See* Longitude, Telegraphic.

**Transcontinental arc.**

Schott, C. A. Results of the transcontinental line of geodetic spirit leveling near the parallel of 39°. Part first, from Sandy Hook, N. J., to St. Louis, Mo. Rept. 1882, app. 11,* pp. 517–556.

——— The transcontinental triangulation and the American arc of the parallel. Sp. pub. 4. (1900.)

*See also* California—Colorado—Indiana—Kansas—Maryland—Missouri—Utah—West Virginia.

**Transfers.** *See* Lithographic transfers.

**Transit errors.**

Hilgard, J. E. Discussion of probable error of observation with a Würdemann 26-inch portable transit. Rept. 1854, app. 39,* p. 121.

**Transit.** (Instrument.)

Hilgard, J. E. Method of [using the transit instrument for] observing azimuth employed at Cat island, form of record and reduction. Rept. 1856, app. 27,* pp. 208, 209.

Schott, C. A. Determination of time by the transit instrument. Rept. 1866, app. 9, pp. 55–71.

Smith, Edwin. Description of two new transit instruments for longitude work. Bull. 16. (1889.)

——— Two new portable instruments for longitude work. Constructed at the office of the Survey from designs by Edwin Smith. Rept. 1889, app. 9,* pp. 213–216.

*See also* Longitude, Telegraphic—Star factors—Time.

**Transits.** *See* Lunar spots—Mercury, Transit of—Venus, Transit of.

**Transmission time.**

Walker, S. C. Measures of wave time, made from 1849 to 1851. Rept. 1851, app. 25,* pp. 476–479.

——— Same. Rept. 1866, app. 16,* pp. 109–111.

*See also* Eduction time—Induction time.

**Treasury department.** *See* Coast and geodetic survey.

**Trenchard, S. D.**

Results of the hydrographic survey of St. Simon's sound and Brunswick harbor, Ga. Rept. 1856, app. 49,* pp. 282, 283.

Tide gauge devised by S. D. Trenchard. Rept. 1857, app. 49,* pp. 402, 403.

**Tresca, H., and Barnard, F. A. P.**

Comparison of an iron metre forwarded to France by the Government of the United States of America. Rept. 1867, app. 7,* pp. 134–137.

**Triangulation.**

Triangulation and reconnaissance. (Leaflet printed for distribution at the Pan-American exposition, Buffalo, N. Y.) Sep. pub. (1901.)

Cutts, R. D. Memoranda relating to the field work of the secondary triangulation. Rept. 1868, app. 7,* pp. 109–139.

——— Same, with additions. Sep. pub. (1877.)*

——— Same. Ed. 3. Title changed to Field work of the triangulation. Rept. 1882, app. 9,* pp. 151–197.

---

* Exhausted.

Hodgkins, W. C. Triangulation and reconnaissance. No. 3 in Bull. 29. (1893.)

Kummell, C. H. On the direct synthetical method of adjusting a triangulation. Rept. 1892, pt. 2, app. 12, pp. 535-552.

Lindenkohl, A. Solution of the three-point problem, by determining the point of intersection of a side of a given triangle with a line from the opposite point to the unknown point. Rept. 1869, app. 14, p. 235.

Schott, C. A. Adjustment of horizontal angles of a triangulation. Probable error of observation, derived from observations of horizontal angles at any single station and depending on directions. Rept. 1854, app. 338,* pp. 70-95.

——— The problem of determining a position by angles observed upon a number of given stations. Solution of Gauss, with example. Rept. 1864, app. 13,* pp. 116-119.

——— Adaptation of triangulations to the various conditions of configuration and character of the surface of country and other causes. Rept. 1871, app. 15,* pp. 185-188.

——— Same, with additions. Rept. 1876, app. 20, pp. 391-399.

——— (And Doolittle, M. A.) Method of closing a circuit of triangulation under certain conditions. Rept. 1875, app. 17,* pp. 279-292.

CALIFORNIA. Schott, C. A. Results deduced from the geodetic connection of the Yolo base line with the primary triangulation of California; also a reduction and adjustment of the Davidson quadrilaterals, forming part of that triangulation. Rept. 1885, app. 9, pp. 441-467.

FLORIDA. Simpson, J. H. Reconnaissance made in triangulation for an air line between Fernandina and Cedar Keys, Fla. Rept. 1857, app. 41,* pp. 379-382.

KANSAS. Hayford, John F. Triangulation northward along the ninety-eighth meridian in Kansas and Nebraska. Rept. 1901, app. 6, pp. 357-423.

MARYLAND. Schott, C. A. Connection of the primary base lines on Kent island, Md., and on Craney island, Va., and on the degree of accuracy of the intervening primary and subprimary triangulations. Rept. 1869, app. 6,* pp. 105-112.

NEBRASKA. Hayford, John F. Triangulation northward along the ninety-eighth meridian in Kansas and Nebraska. Rept. 1901, app. 6, pp. 357-423.

NEW YORK. Schott, C. A. Method of adjustment of the secondary triangulation of Long Island sound. Rept. 1868, app. 8,* pp. 140-146.

——— Connection at Lake Ontario of the primary triangulation of the Coast and geodetic survey with that of the Lake survey. Rept. 1884, app. 9, pp. 387-390.

UNITED STATES. Results of the primary triangulation of the coast of New England from the northeastern boundary to the vicinity of New York. Rept. 1865, app. 21,* pp. 187-203.

Schott, C. A. Report on the method of reduction and results of connection of the Epping base line with the primary triangulation in the eastern states. Rept. 1864, app. 14,* pp. 120-144.

——— Geodetic connection of the two primary base lines in New York and Maryland, their degree of accordance and degree of accuracy of the primary triangulation intervening, with the resulting angles and distances as finally adjusted. Rept. 1866, app. 8,* pp. 49-54.

——— Primary triangulation between the Kent island, Md., and the Atlanta [Georgia] base lines. Rept. 1878, app. 8, pp. 92-120.

——— The Transcontinental triangulation and the American arc of the parallel. Sp. pub. 4. (1900.)

——— The Eastern oblique arc of the United States and osculating spheroid. Sp. pub. 7. (1902.)

VIRGINIA. Schott, C. A. Connection of the primary base lines on Kent island, Md., and on Craney island, Va., and on the degree of accuracy of the intervening primary and subprimary triangulations. Rept. 1869, app. 6,* pp. 105-112.

*See also* Adjustment—Arc measures—Astronomy—Base measures—Geographic positions—Horizontal measures—Hypsometry—Intervisibility—Leveling—Micrometric measures—Reconnaissance—Signals—Tables—Theodolite—Vertical measures.

**Trigonometric leveling.** *See* Elevations—Leveling—Refraction.

**Trigonometric measures.** *See* Elevations—Leveling—Triangulation—Vertical measures.

**Trigonometric points.** *See* Geographic positions.

**Trinidad bay.**

Trinidad, Humboldt and San Diego bays. Rept. 1851, app. 50,* pp. 528-530.

**Tripod.** *See* Signals.

**Trowbridge, William Petit.**

Tidal and magnetic observations of the western coast. Rept. 1854, app. 30,* pp. 37-40.

Magnetic operations on the western coast. Rept. 1855, app. 34,* pp. 223-227.

Method pursued in conducting tidal observations on the western coast of the United States. Rept. 1856, app. 42,* pp. 269, 270.

Investigation of the laws of motion governing the descent of the weight and line in deep-sea soundings. Rept. 1858, app. 37,* pp. 228-246.

Origin, cost and progress of foreign geodetic surveys with other data for comparison with the results of the United States Coast survey. Rept. 1858, app. 40,* pp. 251-270.

Comparison of the cost and progress of the United States Coast survey 1832 to 1844 and 1844 to 1856-57. Rept. 1858, app. 41,* pp. 270-273.

---

* Exhausted.

Apparatus devised by W. P. Trowbridge and method of applying it in determining ocean depths and obtaining specimens of bottom. Rept. 1859, app. 34,* pp. 359-364.
Report at the magnetic station at Key West, Florida reef. Rept. 1860, app. 26,* pp. 326-349.
Instrument devised by him to register depths in sounding, and distance as a log at sea. Rept. 1861, app. 11,* pp. 135-139.

**Ukiah, Cal.**
Smith, Edwin, and Schlesinger, F. The International latitude service at Gaithersburg, Md., and Ukiah, Cal., under the auspices of the International geodetic association. Rept. 1900, app. 5, pp. 495-520.

**Unalashka language.**
Vocabularies of the Kodiac, Unalashka, Kenai and Sitka languages. Rept. 1867, app. 18G,* pp. 293-298.

**Unalaska, Alas.**
Schott, C. A. Resulting longitudes of Kadiak, Unalaska and Unga, Alaska, as determined chronometrically from Sitka in 1896, by the party under the charge of Fremont Morse, assistant. Rept. 1897, pt. 2, app. 3, pp. 263-268.

**Unalaska bay, Alas.**
Jarvis, D. H. Coast pilot notes on the Fox islands passes, Unalaska bay, Bering strait and Arctic ocean as far as Point Barrow. Bull. 40. (1900.)

**Unga, Alas.**
Schott, C. A. Resulting longitudes of Kadiak, Unalaska and Unga, Alaska, as determined chronometrically from Sitka in 1896, by the party under the charge of Fremont Morse, assistant. Rept. 1897, pt. 2, app. 3, pp. 263-268.

**Unifilar traces.** *See* Magnetic declination—Magnetic variations.

**Unimak pass, Alas.**
Moser, J. F. Hydrographic notes, sailing directions, and charts of surveys relating to the vicinity of Prince William sound, Cook inlet, Kadiak island, and route from Unalaska to Chignik through Unimak pass and inside the islands. Bull. 38. (1899.)

**United States.**
ARC MEASURES. Schott, C. A. Report on the method of reduction and results of connection of the Epping base line with the primary triangulation in the eastern states. Rept. 1864, app. 14,* pp. 120-144.
——— Measures of arc of meridian of 3° 23′ between Nantucket [Mass.], and Farmington, Me. Rept. 1868, app. 9,* pp. 147-153.
——— The Pamplico-Chesapeake arc of the meridian and its combination with the Nantucket and the Peruvian arcs for a determination of the figure of the earth from American measures. Rept. 1877, app. 6,* pp. 84-95.
——— Primary triangulation between Kent island [Maryland] and Atlanta [Georgia] base lines. Rept. 1878, app. 8, pp. 92-120.
——— Results of the transcontinental line of geodetic spirit leveling near the parallel of 39°. Part first, from Sandy Hook, N. J., to St. Louis, Mo. Rept. 1882, app. 11, pp. 517-556.
——— The transcontinental triangulation and the American arc of the parallel. Sp. pub. 4. (1900.)
——— The Eastern oblique arc of the United States and osculating spheroid. Sp. pub. 7. (1902.)
BOUNDARIES. Dall, W. H. Boundary line between the territory of the United States and of Russia, passing through Bering Strait. Rept. 1880, app. 16,* sup. note, pp. 335-339.
CHANNELS. Least water in channel entrances to certain harbors, rivers and anchorages on the coasts of the United States. Rept. 1857, app. 21,* pp. 178-184.
Whiting, W. D., and Pourtales, L. F. Channel entrances of harbors, rivers, ports and anchorages on the coasts of the United States. Rept. 1856, app. 18,* pp. 133-137.
COAST PILOT. *See* List of Coast pilots in Part I.
GRAVITY. Mendenhall, T. C. Determinations of gravity with the new half-second pendulums of the Coast and geodetic survey at stations on the Pacific coast, in Alaska, and at the base stations, Washington, D. C., and Hoboken, N. J. Rept. 1891, pt. 2, app. 15, pp. 503-564.
Putnam, G. R. Determination of relative value of gravity in Europe and the United States in 1900. Rept. 1901, app. 5, pp. 345-355.
——— (And Gilbert, G. K.) Relative determinations of gravity with half-second pendulums, and other pendulum investigations by G. R. Putnam, and a report on a geological examination of some Coast and geodetic survey gravity stations by G. K. Gilbert, United States Geological survey. Rept. 1894, pt. 2, app. 1, pp. 7-55.
HISTORY. Kohl, J. G. History of discovery and exploration on the coasts of the United States. Rept. 1884, app. 19,* pp. 495-617.
LEVELING. Hayford, John F. Precise leveling in the United States. Rept. 1899, app. 8, pp. 347-886.

---

* Exhausted.

LEVELING. Schott, C. A. Results of the transcontinental line of geodetic spirit leveling near the parallel of 39°. Part first, from Sandy Hook, N. J., to St. Louis, Mo. Rept. 1882, app. 11,* pp. 517–556.

LONGITUDE. Telegraphic determination of the longitude of San Francisco, Cal. [Signals with Cambridge, Mass.] Rept. 1870, app. 12,* p. 100.

Difference of longitude between Harvard college observatory, Massachusetts, the Coast survey station, Seaton, and the Naval observatory, Washington, D. C., by the electric telegraph in 1867. Rept. 1870, app. 13,* pp. 101–106.

Dean, G. W. Telegraphic method of determining differences of longitude. [Wilmington, N. C., Macon, Ga., and Montgomery, Ala.] Rept. 1856, app. 21,* pp. 167–181.

Gould, B. A. Results of observations for the determination of difference of longitude by telegraph between Seaton station, Washington [D. C.], and Charleston, S. C. Rept. 1853, app. 33,* pp. 86–88.

——— On telegraphic observations for the difference of longitude between Raleigh, N. C., and Columbia, S. C. Rept. 1854, app. 41,* pp. 128–131.

——— Telegraphic operations for difference of longitude between Columbia, S. C., and Macon, Ga. Rept. 1855, app. 46,* pp. 286–295.

——— Operations for difference of longitude between Wilmington, N. C., and Montgomery, Ala. Rept. 1856, app. 20,* pp. 163–166.

——— On the progress made in the different campaigns for differences of longitude. [Washington, D. C., to New Orleans, La.] Rept. 1857, app. 27,* pp. 305–310.

——— Longitude from observations by telegraph between Calais, Me., and New Orleans, La. Rept. 1862, app. 14,* pp. 156–160.

——— On computations connected with the telegraphic method for difference of longitude. [Calais, Me., to New Orleans, La.] Rept. 1863, app. 18,* pp. 154–156.

——— On results of computation for longitude by telegraphic method. [Seaton, D. C., to New Orleans, La.] Rept. 1864, app. 12,* pp. 115–116.

——— Report on the results of determining longitude by the telegraphic method. Rept. 1865, app. 14,* pp. 150–151.

Schott, C. A. Telegraphic longitude of Key West. [Signals with Washington, D. C.] Rept. 1875, app. 9,* pp. 139–156.

——— Determination of longitude by means of the electric telegraph. [Nashville, Tenn., and Atlanta, Ga.] Rept. 1880, app. 14,* pt. 2, pp. 229–241.

——— Results of the longitudes of the Coast and geodetic survey determined up to the present time by the electric telegraph with preliminary adjustment. Rept. 1880, app. 6, pp. 81–92.

——— Longitudes deduced in the Coast and geodetic survey from determinations by means of the electric telegraph, between the years 1846 and 1885. Second adjustment. Rept. 1884, app. 11, pp. 407–430.

——— Telegraphic longitude net of the United States and its connection with that of Europe, 1866–1896. Rept. 1897, pt. 2, app. 2, pp. 197–261.

Walker, S. C. Differences of longitude by telegraph. [Philadelphia, Pa., Jersey City, N. J., Washington, D. C.] Rept. 1846, app. 11,* pp. 72–74.

——— Same. Rept. 1866, app. 13,* pp. 100–102.

——— Difference of longitude of Philadelphia and Greenwich, by reduction of observations at Cambridge, Mass. Rept. 1846, app. 10,* pp. 71, 72.

——— Same. Rept. 1866, app. 12,* pp. 99, 100.

——— Telegraphic operations and computations [Washington and St. Louis]. Rept. 1850, app. 13,* pp. 85–89.

——— Same. Rept. 1866, app. 15,* pp. 106–108.

TERRESTRIAL MAGNETISM. Continuation of list of magnetic stations and results. Rept. 1860, app. 28,* pp. 351, 352.

Bache, A. D. List of magnetic stations and results. Rept. 1858, app. 24,* pp. 191, 192.

——— Magnetic stations and results (supplementary to lists given in Annual reports of 1856, 1858, and 1860, pp. 351–352). Rept. 1862, app. 20,* pp. 230–231.

——— Results of magnetic observations made in the United States by Prof. J. N. Nicollet between 1832 and 1836. Rept. 1864, app. 19,* pp. 207–210.

——— (And Hilgard, J. E.) Tables of magnetic declinations [in geographical order from] Coast survey observations. Rept. 1855, app. 47,* pp. 295–306.

——— On the general distribution of terrestrial magnetism in the United States. Rept. 1856, app. 28,* pp. 209–225.

Bauer, L. A. United States magnetic declination tables and isogonic charts for 1902 and principal facts relating to the earth's magnetism. Sep. pub. (1902.)

Hilgard, J. E. Chart of magnetic declination in the United States, 1875. Rept. 1876, app. 21, pp. 400, 401.

Schott, C. A. Discussion of the secular change in the magnetic declination on the Atlantic and part of the Gulf coasts of the United States. [Ed. 1.] Rept. 1855, app. 48,* pp. 306–337.

Above entry is supplemented by the two following.

——— Secular change of the magnetic declination on the western coast. Rept. 1856, app. 31,* pp. 228–235.

——— Secular change of the magnetic declination, accompanied by tables showing the variation of the needle on the coasts of the United States for every tenth year from the date of the earliest reliable observations. Rept. 1859, app. 24,* pp. 296–305.

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*Exhausted.

TERRESTRIAL MAGNETISM. Schott, C. A. Same. Ed. 2. Title changed to Secular change of magnetic declination in the United States and other parts of North America; new discussion. Rept. 1874, app. 8,* pp. 72–108.

——— Same. Ed. 3. Sep. pub. (1879.)*

——— Same. Ed. 4. Rept. 1879, app. 9,* pp. 124–174.

——— Same. Ed. 5. Rept. 1882, app. 12,* pp. 211–276.

——— Same. Ed. 6. Greatly enlarged. (Apr., 1887.) Rept. 1886, app. 12, pp. 291–407.

——— Same. Ed. 7. (June, 1889.) Rept. 1888, app. 7, pp. 177–312.

——— Same. Ed. 8. Title changed to Secular variation in direction and intensity of the earth's magnetic force in the United States and in some adjacent countries. Rept. 1895, pt. 2, app. 1, pp. 167–320.

——— Results for declination, dip, and horizontal intensity. Rept. 1855, app. 49,* p. 337.

——— Magnetic observations made at stations in Delaware, Maryland, and Virginia. Rept. 1856, app. 29,* pp. 226, 227.

——— Results of observations for magnetic declination, dip, and intensity at stations in section III. [Middle Atlantic States.] Rept. 1856, app. 30,* p. 227.

——— Secular variation of the magnetic inclination in the northeastern States. Rept. 1856, app. 32,* pp. 235–245.

——— Magnetic declination, dip, and intensity in 1859. Rept. 1859, app. 23,* p. 296.

——— Secular change of the magnetic declination, accompanied by tables showing the variation of the needle on the coasts of the United States for every tenth year from the date of the earliest reliable observation. Rept. 1859, app. 24,* pp. 296–305.

——— Secular change of magnetic intensity on the Atlantic, Gulf, and Pacific coasts of the United States. Rept. 1861, app. 22, pp. 242–251.

——— Distribution of the magnetic declination on the coasts of Virginia, South Carolina, and Georgia, with a chart of the isogonic curves for 1860. Rept. 1861, app. 24,* pp. 256–259.

——— Distribution of the magnetic declination on the coast of the Gulf of Mexico, with a chart of the isogonic curves for 1860. Rept. 1861, app. 23, pp. 251–256.

——— Secular change of magnetic declination in the United States and other parts of North America; new discussion. Rept. 1874, app. 8*, pp. 62–65.

——— Declination, dip, and intensity from observations made by the U. S. Coast and geodetic survey between 1833 and 1882. Rept. 1881, app. 9, pp. 159–224.

——— Distribution of the magnetic declination in the United States at the epoch January, 1885, with three isogonic charts. Rept. 1882, app. 13,* pp. 277–328.

——— Geographical distribution and secular variation of the magnetic dip and intensity in the United States. Rept. 1885, app. 6, pp. 129–274.

——— The distribution of the magnetic declination in the United States for the epoch 1890. Rept. 1889, app. 11, pp. 233–402.

——— The secular variation and annual change of the magnetic force at stations occupied, in connection with U. S. Eclipse expedition to the west coast of Africa, in 1889–1890. Rept. 1891, pt. 2, app. 3, pp. 21–39.

——— Distribution of the magnetic declination in the United States for the epoch January 1, 1900. Rept. 1896, pt. 2, app. 1, pp. 147–235.

——— Distribution of the magnetic dip and the magnetic intensity in the United States for the epoch January 1, 1900. Rept. 1897, pt. 2, app. 1, pp. 159–196.

TOPOGRAPHY. Wainwright, D. B. Model of United States and Alaska. No. 13 in Bull. 29. (1893.)

TRIANGULATION. Results of the primary triangulation of the coast of New England from the northeastern boundary to the vicinity of New York. Rept. 1865, app. 21,* pp. 187–203.

Schott, C. A. Report on the method of reduction and results of connexion of the Epping base line with the primary triangulation in the eastern states. Rept. 1864, app. 14,* pp. 120–144.

——— Geodetic connection of the two primary base lines in New York and Maryland, their degree of accordance and degree of accuracy of the primary triangulation intervening, with the resulting angles and distances as finally adjusted. Rept. 1866, app. 8,* pp. 49–54.

——— Primary triangulation between the Kent island, Md., and the Atlanta [Georgia] base lines. Rept. 1878, app. 8, pp. 92–120.

——— The Transcontinental triangulation and the American arc of the parallel. Spec. Pub. 4 (1900).

*See also* Alaska—Atlantic coast—Chesapeake bay—Columbia river—Delaware bay—Gulf coast—Hudson river—Lake Champlain—Long Island sound—Mississippi river—New England—Pacific coast—Potomac river. *See also* State names.

**United States Eclipse expedition.**

Schott, C. A. The secular variation and annual change of the magnetic force at stations occupied in connection with the U. S. Eclipse expedition to the west coast of Africa in 1889–1890 in charge of Prof. D. P. Todd. Bull. 23. (1891.)

——— Same. Rept. 1891, pt. 2, app. 3, pp. 21–39.

**United States Government.** *See* Coast and geodetic survey—Fish commission—Lake survey—Naval observatory—Weights and measures office.

**United States Signal office.** *See* Ooglaamie.

**Utah.** *See* Salt Lake base—Transcontinental arc.

**Vancouver, Mt.** *See* Mt. Vancouver.

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*Exhausted.

**Variation of the compass.** *See* Magnetic declination.

**Variations.** *See* Magnetic variations.

**Velocity.** *See* Currents—Rivers.

**Venus, Transit of.**
Davidson, George. Transit of Venus (1874). Rept. 1875, app. 13,* pp. 222–230.
Schott, C. A. Transit of Venus, 1769. Results of observations for determining positions occupied in Lower California and at Philadelphia. Rept. 1874, app. 10,* pp. 131–133.
——Transit of Venus of December 6, 1882 [United States]. Rept. 1883, app. 16, pp, 371–373.
Smith, Edwin. Transit of Venus, Chatham island, 1874. Rept. 1875, app. 14,* pp. 231–248.

**Vermont.** *See* Lake Champlain—New England.

**Vertical measures.**
Davidson, George, and Schott, C. A. Comparison of the methods of determining heights by means of leveling, vertical angles, and barometric measures, from observations at Bodega Head and Ross mountain, California. Rept. 1871, app. 11,* pp. 154–170.
—— Same. Rept. 1876, app. 16, pp. 338–354.
*See also* Micrometric measures—Triangulation.

**Vertical, Deviation of the.** *See* Plumb-line deflection.

**Vertical force.** (Magnetic.) *See* Magnetic intensity.

**Vibration.** *See* Pendulum.

**Vineyard sound, Mass.**
Mitchell, H. Tidal observations on the south shore of Massachusetts and in Nantucket and Vineyard sounds. Rept. 1854, app. 29,* pp. 35–37.
—— Interference tides of Nantucket and Martha's Vineyard sounds. Rept. 1856, app. 37,* pp. 261–263.
—— Tides and currents in Nantucket and Martha's Vineyard sounds and in East river at Hell Gate, with remarks on the revision of levelings on Hudson river. Rept. 1857, app. 35,* pp. 350–354.
—— On the movements of the sands at the eastern entrance to Vineyard sound. Rept. 1887, app. 6, pp. 159–163.
*See also* Muskeget channel.

**Virginia.**
BOUNDARY. Whiting, H. L. Report in relation to a portion of boundary line in dispute between the states of Maryland and Virginia. Rept. 1890, app. 11, pp. 621–623.
LEVELING. Schott, C. A. Resulting heights from spirit leveling between Old Point Comfort and Richmond, Va., 1884, 1891, and 1892. Rept. 1896, pt. 2, app. 2, pp. 237–246.
—— Resulting heights from spirit leveling between Richmond, Va., and Washington, D. C., 1883 and 1884, with releveling between Richmond and Fredericksburg in 1886 and verification leveling between the two cities in 1895. Rept. 1896, pt. 2, app. 3, pp. 247–260.
TERRESTRIAL MAGNETISM. Schott, C. A. Distribution of the magnetic declination on the coast of the Gulf of Mexico, with a chart of the isogonic curves for 1860. Rept. 1861, app. 24,* pp. 256–259.
—— Magnetic observations made at stations in Delaware, Maryland, and Virginia. Rept. 1856, app. 29,* pp. 226, 227.
—— Results of observations for magnetic declination, dip, and intensity at stations in Section III. [Delaware, Maryland, and Virginia.] Rept. 1856, app. 30,* p. 227.
TRIANGULATION. Schott, C. A. Connection of the primary base lines on Kent island, Md., and Craney island, Va., and on the degree of accuracy of the intervening primary and subprimary triangulations. Rept. 1869, app. 6,* pp. 105–112.
*See also* Atlantic coast—Chesapeake bay—Eastern oblique arc—James river—Pamplico-Chesapeake arc—Petersburg—Pocomoke sound—Potomac river—Tangier sound.

**Viscous fluid.**
Craig, Thomas. General properties of the equations of steady motion. Sep. pub. (1881.)

**Vocabularies.** *See* Languages.

**Voltaic current.** *See* Electro-magnetism.

**Voyages.**
Davidson, George. An examination of some of the early voyages of discovery and exploration on the northwest coast of America, from 1539 to 1603. Rept. 1886, app. 7, pp. 155–253.
Pourtales, L. F. Voyage of the steamer Hassler from Boston to San Francisco. Rept. 1872, app. 11,* pp. 213–221.
Schott, C. A. On the magnetic observations made during Bering's first voyage to the coasts of Kamchatka and eastern Asia in the years 1725–1730. Rept. 1891, pt. 2, app. 5, pp. 269–273.
*See also* Expeditions.

**Vreeland, C. E.**
Description of C. & G. S. steamer Blake and her deep-sea apparatus. No. 14 in Bull. 29. (1893.)

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* Exhausted.

**Waikiki, Hawaiian islands.**

Preston, E. D. Transit of Mercury of May 9, 1881, at Waikiki, Hawaiian islands. Rept. 1891, pt. 2, app. 12; pp. 475-477.

— Variation of latitude at Waikiki, near Honolulu, Hawaiian islands, as determined from observations made in 1891 and 1892, in co-operation with the International geodetic association. Rept. 1892, pt. 2, app. 2, pp. 53-159.

—— Results of observations for the variations of latitude at Waikiki, Hawaiian islands, in co-operation with the work of the International geodetic association. Bull. 27. (1893.)

— The constant aberration as determined from a discussion of results for latitude at Waikiki, Hawaiian islands. Bull. 28. (1893.)

**Wainwright, Dallas Bache.**

Preparation and arrangement of the exhibit of the U. S. Coast and geodetic survey at the World's columbian exposition, 1893. Rept. 1893, pt. 2, app. 10, pp. 425-439.

Model of United States and Alaska. No. 13 in Bull. 29. (1893.)

A plane table manual. Rept. 1898, app. 8,* pp. 409-461.

Notice relative to the use of charts issued by the United States Coast and geodetic survey. Sp. pub. 6. (1900.)

**Walker, Sears C.**

Differences of longitude of Philadelphia and Greenwich, by reduction of observations at Cambridge, Mass. Rept. 1846, app. 10,* pp. 71, 72.

Same. Rept. 1866, app 12,* pp. 99, 100.

Differences of longitude by telegraph. Rept. 1846, app. 11, pp. 72-74.

Same. Rept. 1866, app. 13,* pp. 100-102.

Recapitulation of results for personal equation, 1844-1848. Rept. 1848, app. 4,* pp. 77-83.

Longitude computations. Rept. 1848, app. 19,* pp. 112-118.

Same. Rept. 1866, app. 14,* pp. 102-105.

Telegraphic operations and computations [Washington and St. Louis]. Rept. 1850, app. 13,* pp. 85-89.

Same. Rept. 1866, app. 15,* pp. 106-108.

Arrangement with Maine telegraph company to determine the difference of longitude between Cambridge and Halifax. Rept. 1851, app. 18,* pp. 462, 463.

Measures of wave-time made from 1849 to 1851. Rept. 1851, app. 25,* pp. 476-479.

Same. Rept. 1866, app. 16,* pp. 109-111.

Abstract of reports on longitudes. Rept. 1851, app. 26,* pp. 480, 481.

Same. Rept. 1866, app. 17,* pp. 111, 112.

**Washington.**

Alden, James. The coast, harbors, and commerce of Washington territory. Rept. 1855, app. 29,* pp. 188-192.

Goldsborough, H. A. Resources of Washington territory. Rept. 1856, app. 57,* pp. 293-295.

*See also* Columbia river—Fort Steilacoom—Pacific coast—Port Townsend.

**Washington, D. C.**

CONFERENCES. Proceedings of the Topographical conference held at Washington, D. C., January 18 to March 7, 1892. Rept. 1891, pt. 2, app. 16, pp. 565-746.

Report of a conference on gravity determinations held at Washington, D. C., in May, 1882. Rept. 1882, app. 22, pp. 503-516.

Proceedings of the Geodetic conference held at Washington, D. C., January 9 to February 28, 1894. Rept. 1893, pt. 2, app. 9, pp. 223-424.

ECLIPSE. Schott, C. A. Observations of solar eclipse of July, 1860, at the Coast survey office, Washington, D. C. Rept. 1861, app. 20, pp. 239-241.

GEOGRAPHIC POSITION. Preston, E. D. Establishment of the United States Naval observatory circle, and the determination of the geographical position of the center of the clock room. Rept. 1896, pt. 2, app. 6,* pp. 285-291.

GRAVITY. Preston, E. D. Telegraphic determination of the force of gravity at Baltimore, Md., from simultaneous pendulum observations at Washington and Baltimore. Rept. 1894, pt. 2, app. 2, pp. 57-70.

Mendenhall, T. C. Determinations of gravity with the new half-second pendulums of the Coast and geodetic survey at stations on the Pacific coast, in Alaska, and at the base stations, Washington, D. C., and Hoboken, N. J. Rept. 1891, pt. 2, app. 15, pp. 503-564.

Smith, Edwin. Determinations of gravity with the Kater pendulums at Auckland, New Zealand; Sydney, New South Wales; Singapore, British India; Tokio, Japan; San Francisco, Cal., and Washington, D. C. Rept. 1884, app. 14, pp. 439-473.

PLUMB-LINE DEFLECTION. Schott, C. A. Local deflections of the zenith in the vicinity of Washington city. Rept. 1869, app. 7,* pp. 113-115.

TERRESTRIAL MAGNETISM. Schott, C. A. Secular variation of magnetic declination and dip at Washington, D. C. Rept. 1858, app. 26,* pp. 195-197.

—— Report on the results from the observations made at the magnetical observatory on Capitol hill, Washington, D. C., between 1867 and 1869. Rept. 1869, app. 9, pp. 199-207.

—— Secular changes in the declination, dip, and intensity of the magnetic force at Washington, D. C. Rept. 1870, app. 14,* pp. 107-110.

TRANSIT OBSERVATIONS. Transit of Venus of December 6, 1882, Washington, D. C., at Tepusquet station, California, and at Lehman's ranch, Nevada. Rept. 1883, app. 16, pp. 371-378.

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* Exhausted.

TRANSIT OBSERVATIONS. Schott, C. A. Observations at Washington, D. C., of the transit of Mercury. Rept. 1878, app. 7, pp. 88–91.

——— Transit of Venus of December 6, 1882, at Washington, D. C. Rept. 1883, app. 16, pp. 371–373.

——— (And Tittmann, O. H., Preston, E. D., Smith, E., Putnam, G. R., and Fischer, E. G.) Transit of Mercury on November 10, 1894, Coast and geodetic survey office, Washington, D. C. Rept. 1895, pt. 2, app. 4,* pp. 345–346.

*See also* District of Columbia—Naval observatory—Potomac river—Seaton station.

**Washington, D. C.—Levels—Annapolis, Md.**

Schott, C. A. Result of spirit leveling between tide water at Annapolis, Md., and the Capitol bench mark at Washington, D. C. Rept. 1889, app. 15, pp. 461–466.

**Washington, D. C.—Levels—Hagerstown, Md.**

Schott, C. A. Resulting heights from spirit leveling between Washington, D. C., and Hagerstown, Md. Rept. 1896, pt. 2, app. 4, pp. 261–264.

**Washington, D. C.—Levels—Richmond, Va.**

Schott, C. A. Resulting heights from spirit leveling between Richmond, Va., and Washington, D. C., 1893 and 1894, with releveling between Richmond and Fredericksburg in 1896 and verification leveling between the two cities in 1895. Rept. 1896, pt. 2, app. 3, pp. 247–260.

**Washington, D. C.—Longitude—Charleston, S. C.**

Gould, B. A. Results of observations for the determination of difference of longitude by telegraph between Seaton station, Washington [D. C.], and Charleston, S. C. Rept. 1853, app. 33,* pp. 86–88.

**Washington, D. C.—Longitude—St. Louis, Mo.**

Walker, S. C. Telegraphic operations and computations [Washington and St. Louis]. Rept. 1850, app. 13,* pp. 85–89.

**Water.** *See* Sea water.

**Water level.**

Pourtales, L. F. Effect of winds in varying the level of water in Albemarle sound. Rept. 1856, app. 43,* pp. 271–272.

Schott, C. A. Fluctuations in the level of Lake Champlain and average height of its surface above the sea. Rept. 1887, app. 7, pp. 165–172.

*See also* Sea level.

**Waterspouts.**

Ferrel, William. Meteorological researches for the use of the Coast pilot. Part II. On cyclones, waterspouts, and tornadoes. Rept. 1878, app. 10,* pp. 175–267.

**Wave-time.** *See* Transmission time.

**Waves.** *See* Earthquake waves—Tides.

**Weights and measures office.**

Baylor, J. B. Descriptive catalogue of publications relating to the U. S. Coast and geodetic survey, 1807–1896, and to U. S. Standard weights and measures, 1790 to 1890. Rept. 1891, app. 11, pp. 365–474.

——— Same revised and with additions to 1896. Sp. Pub. 2.* (1898.)

Goodfellow, Edward. Descriptive catalogue of publications relating to the Coast and geodetic survey and to standard measures. Rept. 1883, app. 6, pp. 121–135.

Hayford, John F. The Rueprecht balance belonging to the United States Office of standard weights and measures. Rept. 1895, pt. 2, app. 9,* pp. 383–392.

Schott, C. A. and Tittmann, O. H. Relation between the metric standards of length of the U. S. Coast and geodetic survey and the U. S. Lake survey. Rept. 1889, app. 6,* pp. 179–197.

Stratton, S. W. Weights and measures. (Leaflet printed for distribution at the Pan-American exposition, Buffalo, N. Y.) Sep. Pub. (1901.)

Tittmann, O. H. Historical account of United States standards of weights and measures; of the national prototypes of the metre and the kilogramme; of their transportation from Paris to Washington; of their official opening and certification, and of their deposit in the Office of weights and measures. Rept. 1890, app. 18, pp. 735–758.

——— Verification of weights and measures. Bull. 15. (1890.)

——— Weights and measures. No. 12 in Bull. 29. (1893.)

*See also* Base measures—Meter—Standards.

**Welch, Williams.**

Proportions and spacing of Roman letters as ascertained from the best examples. Rept. 1900, app. 4, pp. 483–494.

**West Indies.** *See* Caribbean sea—Gulf Stream.

**Western coast.** *See* Pacific coast.

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*Exhausted.